DOCUMENT RESUME

ED 098 396 CE 002 499

AUTHOR	Spaeth, William C., Jr.
TITLE	Labor Effort Disincentives of Negative Income Taxation. Final Report.
SPONS AGENCY	Manpower Administration (DOL), Washington, D.C. Office of Research and Development.
PUB DATE	17 Apr 74
NOTE	165p.; Ph.D. Dissertation, Boston College
EDRS PRICE	MF-$0.75 HC-$7.80 PLUS POSTAGE
DESCRIPTORS	Economic Factors; *Economic Research; *Employment Projections; Employment Statistics; Federal Government; *Income; *Labor Economics; Manpower Utilization; Motivation; Policy; Productivity; Statistical Data; Tables (Data); Tax Allocation; *Taxes; Tax Rates; Unemployment
IDENTIFIERS	Labor Disincentives; Manpower Research; Negative Income Tax

ABSTRACT

The study attempts to determine what labor effort disincentives, if any, will result from the introduction of a negative income tax plan into the fiscal structure of the U. S. The study's conclusions are: disincentives appear to be associated with negative income taxation, and these disincentives depend on whether the worker is in the manufacturing or nonmanufacturing industries. And, the disincentive effect for any group of workers is extremely sensitive to the employment opportunities of that group. That is, the groups of workers which should be least influenced by the aggregate employment opportunities show a small response to the proxy used, and the groups of workers which are subject to a wide variation of employment opportunities show no disincentive because their reactions to the tight labor market of 1966 greatly outweigh any disincentives from the proxy. The policy implications would be that, while it is likely workers will exhibit disincentive tendencies under a negative income tax scheme, these tendencies will be greatly outweighed by conditions in the aggregate labor market. In the appendix a complete listing of the regression results is presented for the various subgroups. A four-page bibliography concludes the document. (Author/MW)

ED 098396

BEST COPY AVAILABLE

CE

Department of Economics

Boston College

Labor Effort Disincentives of Negative Income Taxation

by

William C. Spaeth, Jr.

April 17, 1974

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY
William C. Spaeth
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER."

The material in this project was prepared under Grant No. 91-25-73-26 from the Manpower Administration, U.S. Department of Labor, under the authority of title I of the Manpower Development and Training Act of 1962, as amended. Researchers undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment. Therefore, points of view or opinions stated in this document do not necessarily represent the official position or policy of the Department of Labor.

CE 002497

BOSTON COLLEGE
GRADUATE SCHOOL

The thesis of William C. Spaeth, Jr.

entitled Labor Effort Disincentives of Negative Income Taxation

submitted to the Department of Economics

in partial fulfillment of the requirements for the degree of

Doctorate in the Graduate School of

Boston College has been read and approved by the Committee:

Ann F. Friedlaender

Barry Bluestone

Richard Tresch

April 17, 1974
Date

BIBLIOGRAPHIC DATA SHEET

1. Report No. DLMA

2.

3. Recipient's Accession No.

4. Title and Subtitle

Labor Effort Disincentives of Negative Income Taxation

5. Report Date April 1974 (date of iss.)

6.

7. Author(s) William C. Spaeth, Jr.

8. Performing Organization Rept. No.

9. Performing Organization Name and Address

Department of Economics
Boston College
Chestnut Hill, MA 02167

10. Project/Task/Work Unit No.

11. Contract/Grant No. DL 91-25-73-26

12. Sponsoring Organization Name and Address

U.S. Department of Labor
Manpower Administration
Office of Research and Development
601 "D" Street, N.W., Washington, D.C. 20213

13. Type of Report & Period Covered Final Report (dissertation)

14.

15. Supplementary Notes

16. Abstracts

This study attempts to determine what labor effort disincentives, if any, will result from the introduction of a negative income tax plan into the fiscal structure of the U.S. The study's conclusions are: disincentives appear to be associated with negative income taxation, and these disincentives depend upon whether the worker is in the manufacturing or nonmanufacturing industries. And, the disincentive effect for any group of workers is extremely sensitive to the employment opportunities of that group. That is, the groups of workers which should be least influenced by the aggregate employment opportunities show a small response to the proxy used, and the groups of workers which are subject to a wide variation of employment opportunities show no disincentive because their reactions to the tight labor market of 1966 greatly outweigh any disincentives from the proxy. The policy implications would be that, while it it likely workers will exhibit disincentive tendencies under a negative income tax scheme, these tendencies will be greatly outweighed by conditions in the aggregate labor market.

17. Key Words and Document Analysis. 17a. Descriptors

Earnings
Economic analysis
Economic models
Employment
Government policies
Labor
Unemployment

17b. Identifiers/Open-Ended Terms

Labor disincentives
Taxation
Negative income tax
Welfare plans

17c. COSATI Field/Group C

18. Availability Statement Distribution is unlimited.
Available from National Technical Information Service, Springfield, Va. 22151

19. Security Class (This Report) UNCLASSIFIED

20. Security Class (This Page) UNCLASSIFIED

21. No. of Pages 165

22. Price

THIS FORM MAY BE REPRODUCED

© Copyright by William C. Spaeth, Jr., 1974. Reproduction
by the U.S. Government in whole or in part is permitted
for any purpose.

ACKNOWLEDGMENTS

It would be impossible to acknowledge all of the people that helped in the ultimate completion of this dissertation. A great deal of thanks has to go to Ann Friedlaender, my thesis director, who read many versions of this paper over a two year period. Without her encouragement and suggestions, the paper would never have made it from its embryonic stage as a course paper to a thesis topic and finally a dissertation. Richard Tresch provided invaluable assistance with the theoretical chapters and was a most patient reader. Barry Bluestone, my third reader, was especially helpful with the empirical work. He was directly responsible for my obtaining a valuable data set from Malcolm Cohen and encouraged me to apply to the Department of Labor for financial assistance. My receipt of a dissertation grant from the Manpower Administration allowed me to work full time on the dissertation.

Finally, my wife, Jeanne, provided immeasureable assistance in the actual organization and writing of this dissertation. It would not be an exaggeration to say that she spent as much or more time on the various drafts as I did. This thesis is dedicated to her.

TABLE OF CONTENTS

ABSTRACT viii

CHAPTER 1: INTRODUCTION 1

Need for Further Research and the Income Transfer Programs
The Negative Income Tax Proposal
Graphical Consideration of the Negative Income Tax
The Need for Action
Past and Present Research
The Scope of this Study

CHAPTER 2: THEORY 25

The Simple Work Effort Model with Taxes
The Difference Between Positive and Negative Taxation
The Disincentive Effect of Negative Income Taxation
The Substitution and Transfer Income Effects

CHAPTER 3: REDUCED FORM 35

The Basic Model Including the Proxy Variable
The Reduced Form Equation
Interpretation of the Coefficients of the Reduced Form
Consideration of Macro-Economic Variables

CHAPTER 4: THE DATA 50

Description of the Data
Selection of Individuals to be Studied
Addition of Labor Market Variables
Addition of Occupational Variables
Addition of Industrial Variables
Addition of Unemployment Compensation Benefits
Recoding of Some Variables

CHAPTER 5: EMPIRICAL RESULTS 66

Stratifying the Observations
Estimation Procedure: Two Stage Least Squares
The Proxy Variable and "Unearned Income"
Some Useful Concepts
An Empirical Example and Test
Reconsideration of Stratifying the Male Labor Force
Regression Results for the Male Labor Force
Interpretation of Regression Results
The Substitution Effect, Transfer Income Effect, and Elasticities

CHAPTER 6: CONCLUSIONS 100

APPENDIX 105

BIBLIOGRAPHY 154

LIST OF TABLES

TABLE 1: PERCENT OF PERSONS BELOW POVERTY LINE (1959-1971) 3

TABLE 2: EXPENDITURES ON WELFARE PROGRAMS (1960-1972) 14

TABLE 3: NUMBER OF RECIPIENTS OF VARIOUS CATEGORIES OF AID (1960-1972) 15

TABLE 4: LIST OF VARIABLES 52

TABLE 5: LABOR MARKET VARIABLES 56

TABLE 6: OCCUPATIONAL VARIABLES 59

TABLE 7: INDUSTRIAL VARIABLES (manufacturing industries only) 62

TABLE 8: INDUSTRIAL VARIABLES (manufacturing industries only) 63

TABLE 9: STRATIFICATION CHARACTERISTICS FOR THE VARIOUS SUBGROUPS . . 67

TABLES 10.1 - 10.8: SUMMARIES OF REGRESSION RESULTS 79

TABLE 11: HOURS AND WEEKS WORKED BY WAGE RATE FOR ALL, MARRIED, PRIME AGED, MALE WORKERS 91

TABLE 12: HOURS AND WEEKS WORKED BY WAGE RATE FOR ALL NONWHITE MALE WORKERS 91

TABLES 13.1 - 13.3: SUMMARIES OF DISINCENTIVES 96

TABLES A.1.1A - A.1.3N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE WORKERS 108

TABLES A.2.1A - A.2.3N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE WORKERS 117

TABLES A.3.1A - A.3.3N: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE WORKERS 126

TABLES A.4.1A - A.4.2A: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, NONWHITE WORKERS 135

TABLES A.5.1A - A.5.3N: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE WORKERS 137

TABLES A.6.1A - A.6.3A: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, NONWHITE WORKERS 146

TABLES A.7.1A - A.7.2A: REGRESSION RESULTS FOR MALE, SOUTHERN, UNMARRIED, WHITE WORKERS 151

TABLE A.8.2A: REGRESSION RESULTS FOR MALE, SOUTHERN, UNMARRIED, NONWHITE WORKERS 153

ABSTRACT

This study attempts to determine what labor effort disincentives, if any, will result from the introduction of a negative income tax plan (or similar income transfer scheme) into the fiscal structure of the United States. The study is motivated by the recognition that, while poverty in the United States has steadily declined over the last twenty or thirty years, it will continue to exist unless some significant action is taken by the government. Furthermore, the *ad hoc* attempts to alleviate the pains of poverty before the "war on poverty" and the many social programs of the "war on poverty" to eliminate poverty have left the nation with a bureaucratic welfare system. What is needed is one federally sponsored program reaching all of the poor and getting at the immediate problem of poverty--low income. One of the most often mentioned possibilities for doing this is the negative income tax.

The possible labor effort disincentives are discussed in some detail, both heuristically and theoretically. It is found that the labor effort of individuals would probably be decreased with the introduction of a negative income tax. However, since no negative income tax data is extant, the exact magnitude of these disincentives is unknown. A proxy variable is constructed which has theoretical similarities to the negative income tax rate, but which is readily obtainable. The proxy is the unemployment compensation rate. It is shown that, using the proxy variable, the total disincentive effect can easily be decomposed into the substitution and transfer income effects. Finally, a reduced form equation is derived that allows the identification of the coefficients that will be used to measure the disincentive effects.

The data set used in the empirical estimation is the 1967 version of the CPS data set. The data set was modified in several ways through the elimination of some observations and the addition of several other variables. The final data set includes male workers between the ages of 21 and 65 who live in the 93 largest SMSA's. The data set is further stratified into 46 subgroups according to region, marital status, age, and industry type. The two stage least squares procedure is used to estimate the final reduced form equation.

The conclusions from this study are: disincentives appear to be associated with negative income taxation, and these disincentives depend upon whether the worker is in the manufacturing or nonmanufacturing industries. And, the disincentive effect for any group of workers is extremely sensitive to the employment opportunities of that group. That is, the groups of workers which should be least influenced by the aggregate employment opportunities show a small response to the proxy used, and the groups of workers which are subject to a wide variation of employment opportunities show no disincentive because their reactions to the tight labor market of 1966 greatly outweigh any disincentives from the proxy. The policy implications would be that, while it is likely workers will exhibit disincentive tendencies under a negative income tax scheme, these tendencies will be greatly outweighed by conditions in the aggregate labor market.

CHAPTER 1: INTRODUCTION

This study will attempt to expand the store of knowledge concerning the economic consequences of income transfer policies. More specifically, it will single out for theoretical and empirical investigation the effect of negative income taxation on work effort. This investigation is motivated by the view that a negative income tax plan for transferring income may soon be introduced in America, and, hence, it is important to have some idea of the probable effects of such an introduction on work effort. The bulk of this study, therefore, will be devoted to exploring the effect of nonemployment income, as a surrogate for income from a negative tax plan, on work effort.

Need for Further Research and the Income Transfer Programs

In spite of the large number of studies on the subject, we still know very little about the disincentive effects of a negative income tax. Thus, the lack of accomplishment in answering this fundamental economic question has been due in part to the half-hearted attack made by economists in the first barrage of studies. To be sure, all authors treating the subject of poverty, and the institutions engaged in fighting it, would criticize the welfare system and its heavy reliance on categorical grants--such as aid to the elderly, aid to veterans, and aid to families with dependent children--as degrading, inefficient, and slow-moving in the battle against poverty.[1] However, despite all of the oratory and maligning of the present welfare system, there was a general underlying acceptance of the fact that poverty was being conquered.

The muffled call to action can better be understood when we realize that in the late 1940's over 30 percent of the population was below the poverty line and that by the early 1960's (before the "war on poverty") the rate had fallen to under 20 percent.[2] The downward trend in the percentage of poor had been slow and steady. Often in the 1960's a simple extrapolation would be used to show that, at the present rate, it would take twenty or more years to eliminate poverty totally. Passing reference would be made to the difficulty of reducing poverty any further when the percentage reached about 5 percent because the welfare system would be up against the hard-core poor. Examination of Table 1 will reveal how tempting such an analysis of this type was to make. The numbers, because they represent millions of Americans, are not pleasant to contemplate, but the data, at least through 1969, does contain a heartening trend that makes one reasonably optimistic about the future.

Having established that the present welfare system was demoralizing and inefficient, and qualifying the criticism by a tacit recognition of a slow, but steady progress, the economic writer would often go on to propose a new scheme for the elimination of poverty--a scheme based on transfer of income and founded more securely in economic theory than the

---

[1] See Joseph A. Kershaw, Government Against Poverty (Washington, D.C.: Brookings Institution, 1970), for a concise, but thorough, examination of the various agencies and programs aimed at reducing poverty.

[2] Council of Economic Advisers, Economic Report of the President (Washington, D.C.: Government Printing Office, 1964), 59.

TABLE 1: PER CENT OF PERSONS BELOW POVERTY LINE (1959-1971)

Year	All Races		White		Nonwhite		Families (All Races)			
	In Families	Unrelated Individuals	In Families	Unrelated Individuals	In Families	Unrelated Individuals	Headed by Male	Headed by Female	Head 35-44 Years	Head Over 65
1959	20.8	46.1	16.5	44.1	56.0	57.4	15.8	42.6	15.5	30.0
1960	20.7	45.2	16.2	43.0	55.7	59.3	15.4	42.4	14.9	27.2
1961	20.3	45.9	15.8	43.2	55.6	62.7	15.4	42.1	15.5	28.5
1962	19.4	45.4	14.7	42.7	55.3	62.1	14.3	42.9	15.5	25.5
1963	17.9	44.2	13.6	42.0	50.5	58.3	13.1	40.4	14.3	25.0
1964	17.4	42.7	13.2	40.7	49.1	55.0	12.5	36.4	13.2	23.1
1965	15.8	39.8	11.7	38.1	46.8	50.7	11.1	38.4	11.5	22.8
1966	13.1	38.3	9.7	36.1	38.9	53.1	9.3	33.1	10.1	20.9
1967	12.5	38.1	9.2	36.5	36.3	48.2	8.7	33.3	9.2	21.5
1968	11.3	34.0	8.4	32.2	32.4	45.7	7.3	32.3	8.9	17.0
1969	10.4	34.0	7.8	32.1	29.6	45.5	6.9	32.3	8.0	17.6
1970	10.9	32.9	8.1	30.8	30.7	46.7	7.1	32.5	8.9	16.3
1971	10.8	31.6	8.2	29.6	29.7	44.9	6.8	33.9	9.1	14.2

Source: U.S., Department of Commerce, Bureau of the Census, Current Population Reports, Series P-60, No. 86, "Characteristics of Low-Income Population 1971," 1972, Tables 1 and 21.

just criticized, haphazard welfare system.[3] The basic argument in favor of the income transfer schemes would be that they are not categorical. By eliminating the categorical nature, the new schemes would reduce the demoralizing aspects of the present system by making the poor automatically eligible for transfer income simply because they are poor. More importantly, the proposed anti-poverty measures would, by replacing the categorical welfare system with an automatic income transfer plan, reach all of the poor and not just those fortunate enough to fit one of the definitions and qualify for government assistance. Also, by basing the income subsidy on income, the government could be sure that money went to those below the poverty line and not just those that met, say, a particular demographic characteristic that had nothing to do with poverty. Besides overcoming the obvious arbitrary nature of categorical grants, a national income transfer scheme would overcome the inequities resulting from the differences among states in the aid given to the same category of poor. Finally, by building the income transfer program into the personal income tax structure, the entire program would require a smaller administration[4] and, presumably, be run in a more routine, business-like manner.

The Negative Income Tax Proposal

One of the most popular income transfer schemes has been the negative income tax.[5] The negative income tax has found support from such ideologically opposed economists as Milton Friedman and James Tobin.[6] However, it comes as some small historical curiosity that the single, most impassioned argument in favor of the negative income tax was made by an English economist in 1942. To quote a Mr. A. Romney Green talking about social reconstruction after the war:[7]

---

[3] For a summary of the various income transfer plans, see Christopher Green and Robert J. Lampman, "Schemes for Transferring Income to the Poor," Industrial Relations, Vol. 6 (February, 1967), 121-137.

[4] For a description of the bureaucratic state of the present welfare system employing ten's of thousands of caseworkers, see Edgar May, The Wasted Americans (New York: Harper and Row Publishers, 1964), 104-121.

---

[5] For example, Robert J. Lampman, "Approaches to the Reduction of Poverty," *American Economic Review*, Supplement, Vol. 55 (May, 1965), 521-529; Lowell E. Gallaway, "Negative Income Tax Rates and the Elimination of Poverty," *National Tax Journal*, Vol. 19 (September, 1966), 298-307; Green and Lampman, "Schemes for Transferring Income to the Poor," 121-138; George H. Hildebrand, "Second Thoughts on the Negative Income Tax," *Industrial Relations*, Vol. 6 (February, 1967), 138-154; Earl R. Rolph, "The Case for a Negative Income Tax Device," *Industrial Relations*, Vol. 6 (February, 1967), 155-165; Christopher Green, *Negative Taxes and the Poverty Problem* (Washington, D.C.: Brookings Institution, 1967): Michael K. Taussig, "Negative Income Tax Rates and the Elimination of Poverty: Comment," *National Tax Journal*, Vol. 20 (September, 1967), 328-337; Michael J. Boskin, "The Negative Income Tax and the Supply of Work Effort," *National Tax Journal*, Vol. 20 (December, 1967), 353-367; Christopher Green, "Negative Taxes and Monetary Incentives to Work: The Static Theory," *Journal of Human Resources*, Vol. 3 (Summer, 1968), 280-288; Richard Perlman, "A Negative Income Tax Plan for Maintaining Work Incentives," *Journal of Human Resources*, Vol. 3 (Summer, 1968), 289-299; Peter A. Diamond, "Negative Taxes and the Poverty Problem--A Review Article," *National Tax Journal*, Vol. 21 (September, 1968), 288-303: Jonathan Kesselman, "The Negative Income Tax and the Supply of Work Effort: Comment," *National Tax Journal*, Vol. 22 (September, 1969), 411-416; Earl R. Rolph, "Controversy Surrounding Negative Income Taxation," *Public Finance*, Vol. 24 (1969), 352-361; Dennis Lees, "Controversy Surrounding Negative Income Taxation: Comment," *Public Finance*, Vol. 24 (1969), 362-366; and Kershaw, *Government Against Poverty*, 111-127.

[6] Milton Friedman, *Capitalism and Freedom* (Chicago: University of Chicago Press and Phoenix Books, 1963), 190-192; and James Tobin, "On Improving the Economic Status of the Negro," *Daedalus*, Vol. 94 (Fall, 1965), 878-898.

[7] A. Romney Green, "Social Reconstruction by the Regulation of Incomes," *Economic Journal*, Vol. 52 (April, 1942), 37-44. Also, about the same time in England, Lady Rhys-Williams was proposing a social dividend scheme for transferring income; see, *Taxation and Incentive* (New York: Oxford University Press, 1953), 120-149.

> . . . What better device could we adopt than a fiscal Rule, scientific, as befits the age, but intelligible to the layman, as befits a true democracy, and even more truly democratic in that it operates impartially on rich and poor?--this not to produce a communist flatland, but to mollify the too tragic and precipitous social scenery to which we have been so long accustomed. Just as we have desired and endeavoured that there shall be one Law alike for rich and poor, so let us now determine that in matters economic and fiscal there shall be one Rule for rich and poor; regarding the impartial Rule, at least equally with the impartial Law, as the hallmark of a true democracy.
>
> For the purposes of this Rule, rich and poor are those whose incomes are respectively above and below a certain line corresponding to that which the Treasury regards as the basic income, but which; since it should be considerably higher than it has been, I shall prefer to call here the "normal income." Incomes appreciably below this normal will be augmented by a State endowment which increases as income diminishes, and culminates in a minimum income for all children and nonearning men and women; whilst incomes above the normal will be subject to a tax of a gradually increasing severity.
>
> . . . It is also necessary, somebody may say, that our rate of production should not be seriously slowed down by the effect of our State endowments on the "incentive to labour.". . . . Our minimum income will not, or should not, be such as to give the idler all those little luxuries which are now so dear to the heart of every civilised man. . . . The incentive will no longer act, as it has done, like a whip on the galley-slave; it will rather be felt, indistinguishably from the creative impulse, as a fair wind in the sails of the ship of State.

Mr. Green states, if somewhat grandiloquently, the case for a negative income tax incorporated into an already existing progressive income tax structure and points out the major unanswered question with regard to the consequences of a negative income tax: By basing the income subsidy on the person's income level, how will the person adjust his work effort?

It is a fairly straightforward theoretical exercise to show that the effect of a negative income tax on work effort is unambiguously negative, if leisure is a superior good. That is, as the negative income tax rate increases, the work effort will decrease. The unambiguous nature of the disincentive effect of the negative income tax on work effort can easily be seen when it is realized that, when the negative income tax rate increases, the return to work decreases (i.e., produces a decrease in the cost of leisure) so that the substitution effect is away from work toward leisure. In addition, when the negative tax rate increases, the income subsidy will increase and, hence, the "income" effect (meaning the effect of transfer income) is negative, which further increases the person's tendencies to reduce work effort. Thus, unlike the positive income tax which contains a positive income effect,[8] the negative income tax has unambiguously negative effects[9] on work effort.

Graphical Consideration of the Negative Income Tax

Before we go on to the theoretical and empirical analyses of later chapters, a diagrammatic exposition might serve to reinforce our intuition of the effect of negative income taxation on work effort. We will concern ourselves here only with negative income taxation and postpone a comparison between positive and negative income taxation until the next chapter. As is the case with all graphic representations in consumer theory, we can visualize the individual freely adjusting his consumption of goods until he reaches a point of tangency between his budget constraint and an indifference curve representing the highest attainable level of utility. The model used throughout this study is based on the standard leisure-income utility function in which there are only two goods--leisure and income. We assume that the individual's utility function is well behaved and, hence, his indifference curves will be convex to the origin.

In Figure 1 we have plotted income on the horizontal axis and leisure

---

[8] For a discussion of this point, see Gershon Cooper, "Taxation and Incentive in Mobilization," Quarterly Journal of Economics, Vol. 66 (February, 1952), 43-66.

[9] Some of the qualifications to this "unambiguous" character will be discussed at the beginning and end of the next chapter.

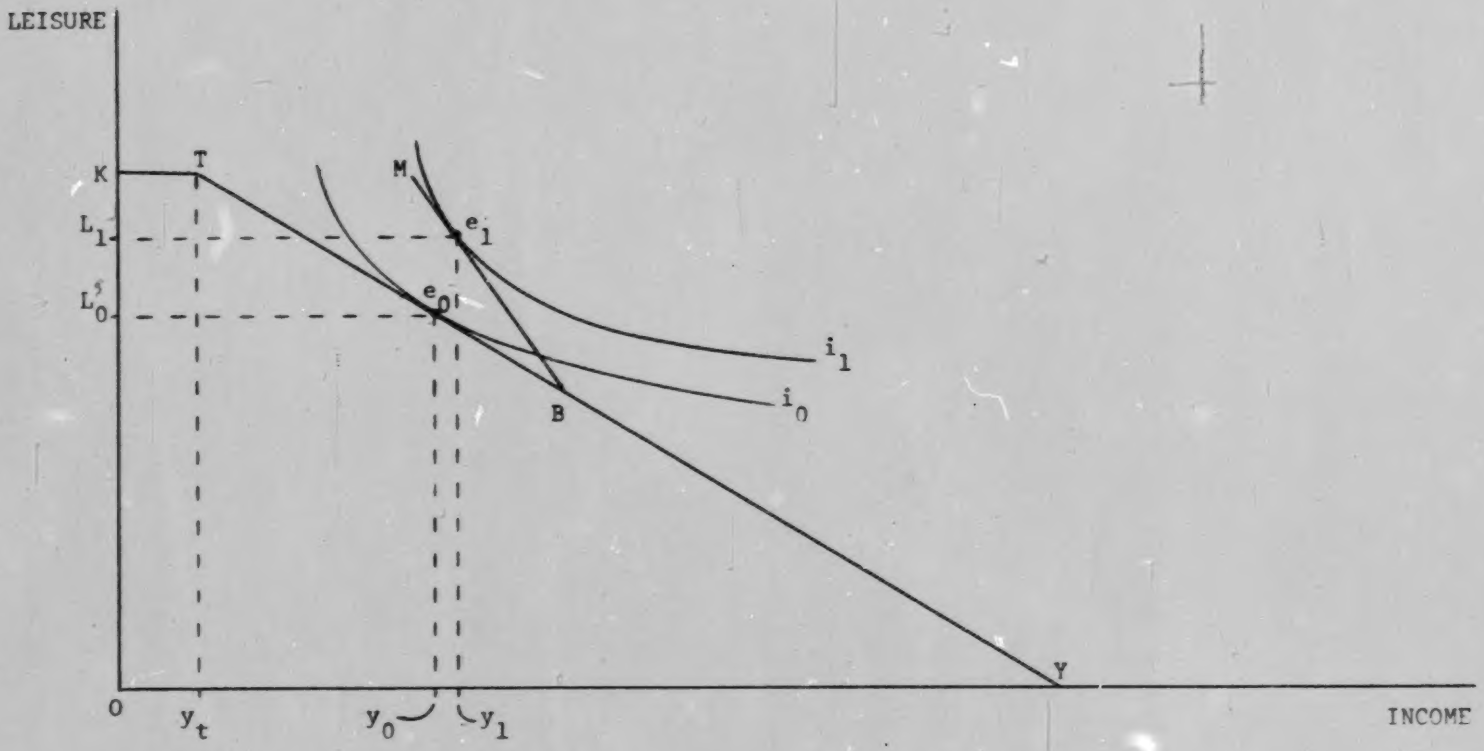

FIGURE 1

on the vertical axis. The budget constraint is TY, where the horizontal distance from the axis, Oy_t, represents the presence of transfer income. It should be noted that the "budget constraint" is really the locus of points representing the possible combinations of income and leisure, given a measure of time, transfer income, and the wage rate.

In standard consumer theory the budget constraint is a function of income and prices: a change in income will shift the budget constraint and a change in the prices will stretch or contract the budget constraint along the relevant axis. In the present case, TY will be a function of the amount of transfer income and the wage rate (thus, we are assuming that the time dimension cannot be changed). A change in transfer income will shift the budget constraint and a change in the wage rate will stretch or contract the budget constraint along the income axis.

In the absence of negative income taxation, the budget constraint will be TY and the individual will reach an equilibrium at point e_0, where his indifference curve i_0 is just tangent to TY. The person will have an income of y_0 and consume an amount of leisure equal to L_0 (i.e., he will work $K-L_0$).

The introduction of a negative income tax plan will have the effect of rotating upward the budget constraint at point B, which corresponds to the breakeven point in the negative tax scheme. That is, all income (earned plus unearned) above the breakeven point is unaffected by the negative tax scheme, but all income (earned plus unearned) below the breakeven point is supplemented by an amount which is a function of the negative income tax's transfer rate. Thus, the budget constraint will bend up at B and the budget constraint with a negative income tax will become MBY (MBY being a function of transfer income, the wage rate, and the

BEST COPY AVAILABLE

transfer rate). With the new budget constraint the individual can be thought to seek again an equilibrium consumption bundle of income and leisure. In Figure 1 we have the individual moving to point e_1 which is the point of tangency between i_1 and MBY. As drawn, the individual consumes more leisure (L_1 versus L_0) and more income (y_1 versus y_0) at e_1 as compared to e_0. That is, the individual reaches a higher level of utility by working less.

By changing the transfer rate we change the opportunity cost of leisure and, hence, the price of leisure. In going from the equilibrium situation with no negative income taxation, e_0, to one where the transfer rate is some number greater than zero, e_1, we can consider the move as due to a change in the price of leisure. That is, the imposition of a negative income tax changes the net wage rate (i.e., the opportunity cost of leisure). Following the standard Slutsky analysis, we can decompose a movement between two equilibrium points due to a change in a price into two separate moves.[10]

In Figure 2 we have enlarged the relevant part of Figure 1 and eliminated all unnecessary lines in order to see better how the movement from e_0 to e_1 can be decomposed into two distinct moves. First, we can visualize that we introduce the negative income tax and rotate the budget constraint while holding the individual's utility constant. That is, the relevant budget constraint is now MBY, but by fixing the individual's level of utility at i_0 we have to shift the budget constraint until it is

---

[10] Of course, Slutsky equations deal with rates of change which cannot be depicted on an indifference-curve diagram. The diagrams represent, rather than actually depict, the substitution and transfer income effects.

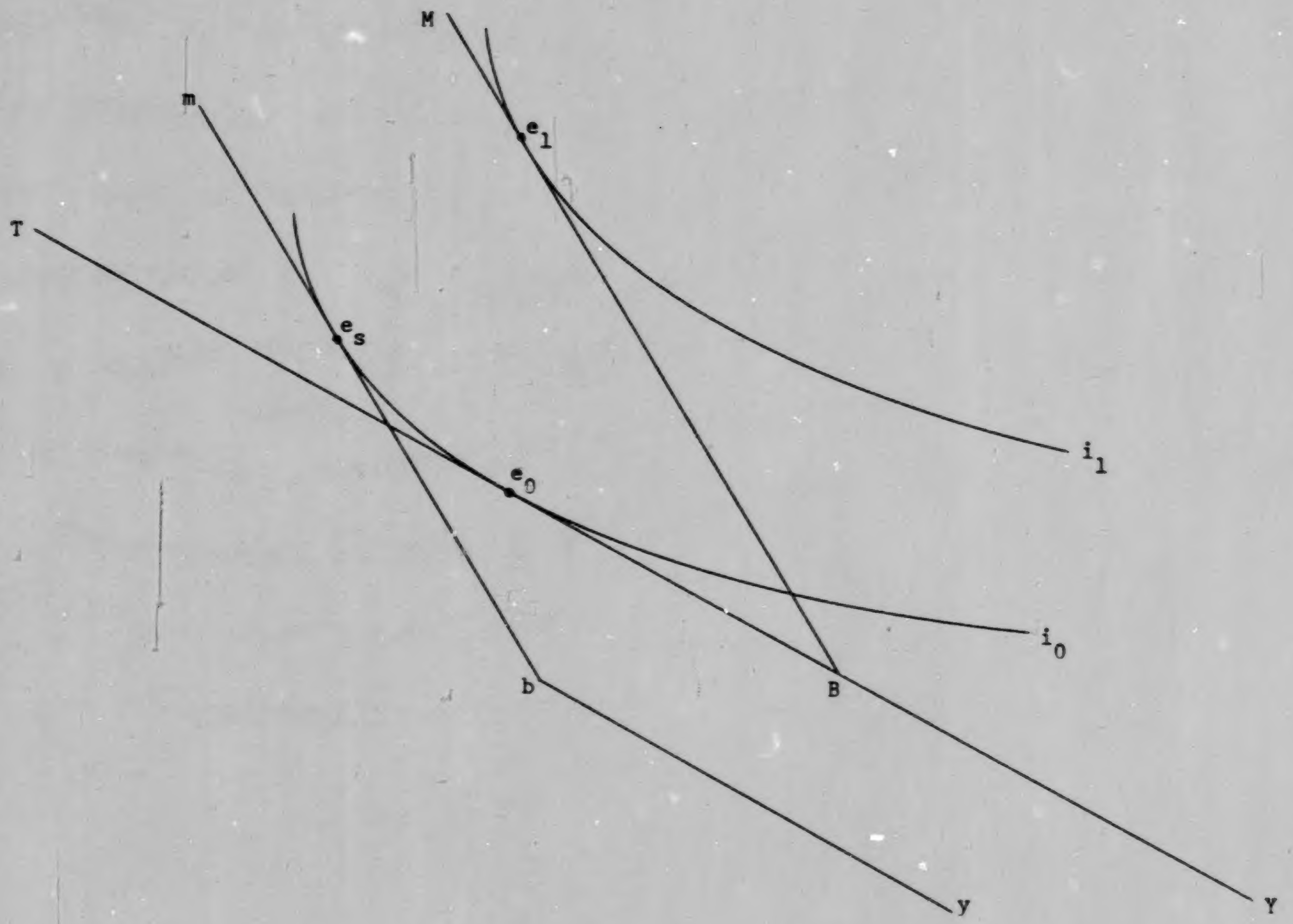
M
m
T
e_1
e_s
e_0
i_1
i_0
b
B
y
Y

FIGURE 2

just tangent to i_0. In Figure 2 we have drawn mby parallel to MBY such that it is just tangent to i_0 at e_S. Therefore, the movement from e_0 to e_S represents how the person would adjust his consumption bundle of income and leisure if he were faced with a negative income tax but held to the same level of satisfaction. This corresponds to the normal substitution effect. However, the person is not constrained to the same level of utility, so we can now shift mby back to MBY and allow the person to reach e_1 from e_S. As was stated previously, the only thing which can shift the budget constraint is transfer income. Therefore, the movement from e_S to e_1 is a graphical approximation of the transfer income effect.

Such theoretical arguments, however, only bait the question of the consequences of a negative income tax or similar scheme on work effort. Mathematical or diagrammatic expositions, while serving the useful purpose of formalizing the arguments and simplifying the analysis, do not give a concrete answer to the problem of exactly how much work effort will be decreased by a negative income tax plan that has, say, a breakeven point of \$3000, a guaranteed minimum of \$1500, and a negative tax rate of 50 percent.

The Need for Action

It is always possible to adopt the attitude taken in the late 1960's that, so long as the income transfer schemes remain essentially academic proposals, there really is not a pressing need for such quantitative analysis. However, waning academic interest in the late 1960's in the negative income tax and its inherent disincentive effects was paralleled by a new turn of events, or, at least, statistics. Re-examination of Table 1 will reveal a very disheartening fact. The steady decline in poverty in America during the 1960's was halted in 1970. The increase in unemployment and slower growth in real GNP in the late 1960's and early seventies have placed a tremendous burden on the welfare system. Record numbers are now receiving aid for most categories of assistance and the number of poor is increasing. Tables 2 and 3 show that the nation is now devoting a record amount of its income (both in an absolute dollar sense and in a relative sense) to reducing poverty, and record numbers of people are receiving aid. Yet, the number of poor in America increases.

It no longer seems quite as tempting to use a simple linear extrapolation and conclude that poverty can be eliminated in so many years. The earlier conclusion that, given the present welfare system, the reduction of poverty is merely a function of time can no longer be sustained. Most of the categorical grants of aid have been pushed to record heights and the number of poor is not dwindling. With such a recognition has come a re-thinking of the academic income transfer schemes. It is possible that in the near future one form or another of a national income transfer scheme will be introduced into the fiscal structure with the aim of either finally eliminating poverty by absolute definition or significantly closing the poverty gap. And, as the transfer schemes edge closer to adoption, the old question of disincentives looms even larger. Undoubtedly, one of the questions that the politicians will again ask the economists is: "What is the effect on work effort of this income transfer scheme?"

Past and Present Research

To be sure, there have been several attempts in the past to measure the disincentive effects of negative income taxation. However, the previous

TABLE 2: EXPENDITURES ON WELFARE PROGRAMS (1960-1972)

[amounts in billions]

Year	Social Insurance and Related Programs		Public Assistance		Total	
	Amount	Percentage of Personal Income	Amount	Percentage of Personal Income	Amount	Percentage of Personal Income
1960	$23.3	5.8	$ 3.2	0.8	$26.5	6.6
1961	26.8	6.4	3.4	0.8	30.2	7.2
1962	27.8	6.3	3.5	0.8	31.3	7.1
1963	29.4	6.3	3.6	0.8	33.0	7.1
1964	30.5	6.1	3.8	0.8	34.3	6.9
1965	33.1	6.1	4.0	0.7	37.1	6.8
1966	36.4	6.2	4.3	0.7	40.7	6.9
1967	43.0	6.8	4.9	0.8	47.9	7.6
1968	48.4	7.1	5.7	0.8	54.5	7.9
1969	53.8	7.1	6.6	0.9	60.4	8.0
1970	63.2	7.8	8.4	1.0	71.6	8.8
1971	73.8	8.5	10.1	1.2	83.9	9.7
1972	81.3	8.7	11.0	1.2	91.3	9.9

Source: U.S., Department of Health, Education, and Welfare, Social Security and Administration, Social Security Bulletin, Vol. 36 (November, 1973).

TABLE 3: NUMBER OF RECIPIENTS OF VARIOUS CATEGORIES OF AID (1960-1972)

[numbers in thousands]

Year	Social Insurance and Related Programs[a]	Unemployment Insurance		Public Assistance				
		Average Weekly Number of Beneficiaries	Number of Claimants Exhausting Benefits	Old-Age	Aid to the Blind	Aid to Families with Dependent Children	General Assistance	Emergency Assistance
1960	20,643	1,640	1,603	2,305	106.9	3,073	1,244	----
1961	22,582	2,004	2,371	2,229	102.7	3,566	1,069	----
1962	24,358	1,525	1,638	2,183	98.7	3,789	900	----
1963	25,514	1,541	1,568	2,152	96.9	3,390	872	----
1964	26,445	1,373	1,371	2,120	95.5	4,219	779	----
1965	27,667	1,131	1,086	2,087	85.1	4,396	677	----
1966	29,689	895	781	2,073	83.7	4,666	663	----
1967	30,755	1,017	867	2,073	82.7	5,309	782	----
1968	31,736	936	848	2,027	80.7	6,086	826	----
1969	32,595	923	811	2,074	80.6	7,313	860	8,000
1970	33,724	1,517	1,295	2,082	81.0	9,659	1,056	9,700
1971	34,907	1,814	1,981	2,024	80.3	10,653	982	13,300
1972	36,193	1,470	1,806	1,934	79.8	11,065	864	14,000

[a] Includes beneficiaries, and their survivors, of: OASDHI, railroad, federal civil service, and veterans payments for retirement and disability.

Source: U.S., Department of Health, Education, and Welfare, Social Security and Administration, Social Security Bulletin, Vol. 36 (November, 1973).

studies have suffered from two major flaws. First, since no national negative income taxation plan is extant, all studies have had to rely on the use of proxy variables as substitutes for negative income tax rates. Secondly, the previous studies have been very narrow in that they studied the work efforts of only one segment of the total labor force. For example, Gallaway used OASDHI payments to the elderly as a proxy variable and measured the work effort responses of the elderly to changes in the payment practices of Social Security; Leuthold selected property income divided by the wage rate as a proxy variable for the negative income tax and only studied the work disincentives of employed heads of households; Green and Tella based their study on families with non-aged male heads and work responses of these male heads to a variable which consisted mainly of property income; and, Boskin's study looked at answers (of people living in one city) in response to hypothetical situations.[11]

It should be noted that an argument could be made here that the various disincentive experiments being performed in New Jersey and elsewhere will soon be able to answer once and for all the disincentive question.[12] However, as Browning has pointed out, these social experiments have a major theoretical flaw in that they ignore the workings of the aggregate labor market.[13] It seems reasonable to expect in the very near future a deluge of studies based on the New Jersey experiment, but it seems doubtful whether the experiment will answer the fundamental question of how far the equilibrium supply of labor effort will fall if a negative income tax plan is adopted. By ignoring one side of the aggregate labor market the prospect of any meaningful results for policy consideration is questionable.

---

[11] Gallaway, "Negative Income Tax Rates and the Elimination of Poverty," 298-307; Jane Leuthold, "An Empirical Study of Formula Income Transfers and the Work Decision of the Poor," Journal of Human Resources, Vol. 3 (Summer, 1968), 312-323; Christopher Green and Alfred Tella, "Effect of Nonemployment Income and Wage Rates on the Work Incentives of the Poor," Review of Economics and Statistics, Vol. 51 (November, 1969), 399-408; and Boskin, "The Negative Income Tax and the Supply of Work Effort," 353-367. Also see Orley Ashenfelter, "Using Estimates of Income and Substitution Parameters to Predict the Work Incentive Effects of the Negative Income Tax: A Brief Exposition and Partial Survey," unpublished, 1970, for a description of more recent (but unpublished) attempts to measure the disincentive effects. And, for a recent summary of the work done in this area, see Glen G. Cain and Harold W. Watts, "Toward a Summary and Synthesis of the Evidence," in Income Maintenance and Labor Supply, ed. by Glen G. Cain and Harold W. Watts (Chicago: Rand McNally College Publishing Company, 1973), 328-367.

To see more clearly what is wrong with these social experiments, consider Figure 1 again. Let us assume that the individual is in one of the subgroups receiving the negative income tax subsidy, is perfectly free to vary his work effort, and actually moves from e_0 to e_1 with the imposition of a negative income tax. Further, assume that the experimentation is designed perfectly so that we get an accurate measure of the person's movement from e_0 to e_1. That is, we record as data that the person would have worked $K-L_0$ and now works only $K-L_1$. Let us say that the individual reduces his work effort by 50 percent. If all the other people in the same subgroup have the same transfer incomes, wage rates, and utility functions as the individual depicted in Figure 1, they will also reduce their work effort by 50 percent. Can we conclude that, if a national negative income tax scheme is adopted with the same parameters as the ones for the experimental subgroup, the labor effort will decrease by 50 percent?

---

[12] The Office of Economic Opportunity (OEO) has funded several regional experiments with negative income taxation. The basic approach of these experiments has been for a private organization (funded by OEO) to select a city or rural area and randomly pick a group of several hundred poor families. The sample of families is then broken up into several subgroups. All but one of the subgroups is given the opportunity to participate in a negative income tax plan--the different schemes having different transfer rates and breakeven points. The one subgroup ineligible for any of the negative income tax plans is the control group. The hope is that, by comparing the work effort responses of those subgroups receiving negative income tax subsidies with those of the control group, it will be possible to measure the disincentive effect of negative income taxation. For preliminary reports on these experiments see: Harold Watts, "Graduated Work Incentives: An Experiment in Negative Taxation," American Economic Review, Supplement, Vol. 59 (May, 1969), 463-472; and "The Graduated Work Incentive Experiment: Current Progress," American Economic Review, Supplement, Vol. 61 (May, 1971), 15-21.

[13] Edgar Browning, "Incentive and Disincentive Experimentation for Income Maintenance Policy Purposes: Note," American Economic Review, Vol. 61 (September, 1971), 709-712; and "Alternative Programs for Income Redistribution: The NIT and NWT," American Economic Review, Vol. 63 (March, 1973), 38-41.

The answer is no. Consider Figure 3 which depicts the aggregate labor market with the usual downward sloping demand curve (D) and upward sloping supply curve (S). Prior to the imposition of the negative income tax, the labor market is at equilibrium at E_0 with N_0 labor being supplied and demanded and a wage rate of w_0 prevailing. After the imposition of the negative income tax, the conclusion implied by the results of the experiment is that the supply curve of labor will shift left (S to S') and that N_E labor will be supplied at a wage rate of w_0. Clearly, this is nonsense. Even if the experiment is accurate in measuring the probable shift in the supply curve of labor, we still have to consider the demand side of the labor market. Unless we assume an infinitely elastic demand curve, the amount of labor supplied and demanded will go from N_0 to N_1 and the wage will rise to w_1. The problem with negative income tax experimentations is that, at the very best, they provide estimates of the microeconomic responses of an insignificant number of individuals, but little insight

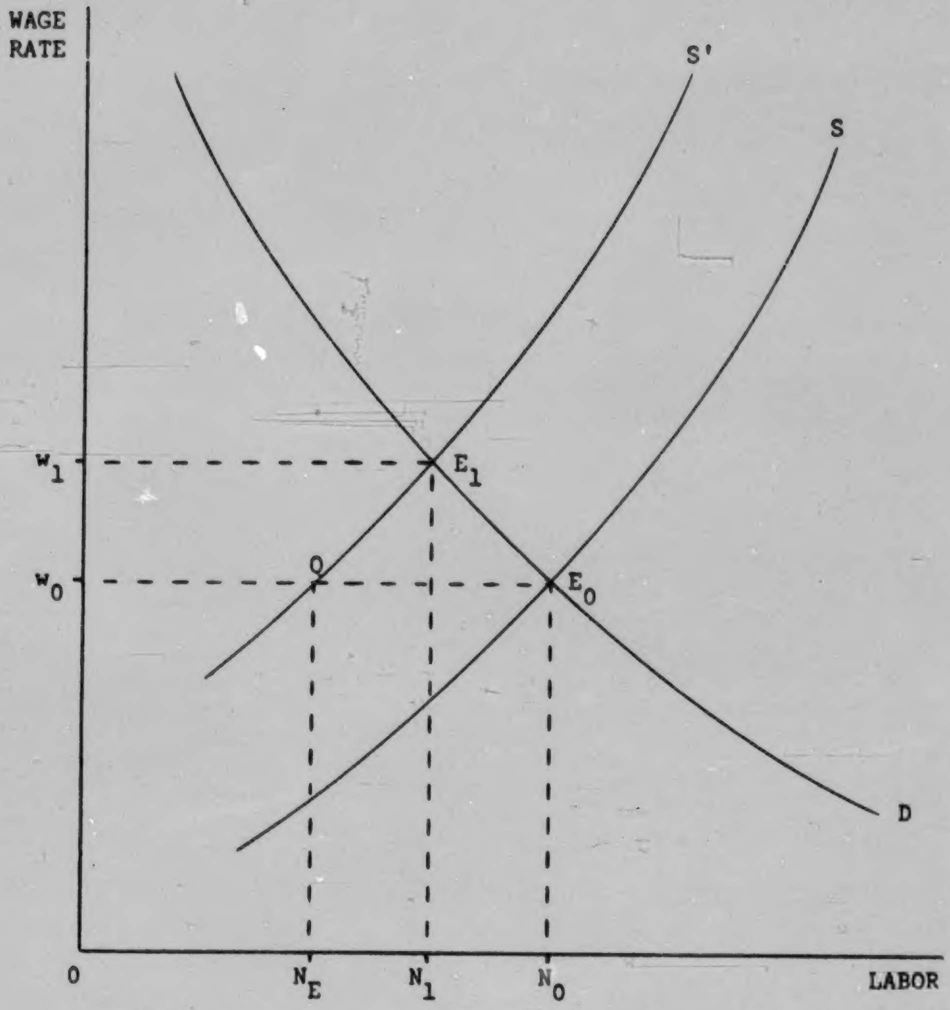

FIGURE 3

into the actual change in labor effort on an aggregate level if a negative income tax were ever adopted.

We can extend the analysis and argue further that by ignoring the aggregate labor market the negative income tax experiments do not even give a complete picture of the microeconomic work responses of individuals. Notice in Figure 3 that the wage rate increases from w_0 to w_1. From the diagrammatic exposition above we have that a change in the wage rate will affect the budget constraint. If the wage rate increases, the budget constraint will be stretched out along the income axis. In Figure 4 we have redrawn Figure 1 with the addition of the budget constraint MB'Y' representing the effect of an increase in the wage rate. The individual will now move from equilibrium point e_1 to equilibrium point e_2 and consume a different bundle of income and leisure. Therefore, the data from the experiments, by ignoring the market mechanism, will not even give us an accurate measure of the response of individuals on a microeconomic level.

Ignoring the aggregate labor market is understandable when one realizes the enormous dollar costs of these experiments. An experiment that contains less than one thousand families and lasts for three years will cost several millions of dollars. The only way to take into consideration the effect of the aggregate labor market on the ultimate equilibrium supply of labor effort would be to make everyone in a particular labor market eligible for the negative income tax subsidy. Such an experiment is, obviously, beyond consideration. Even if an experiment were performed in a labor market area and everyone entitled to participate, the results would only be valid for that particular labor market. That is, it is reasonable to assume that the supply and demand curves for the Cleveland labor market

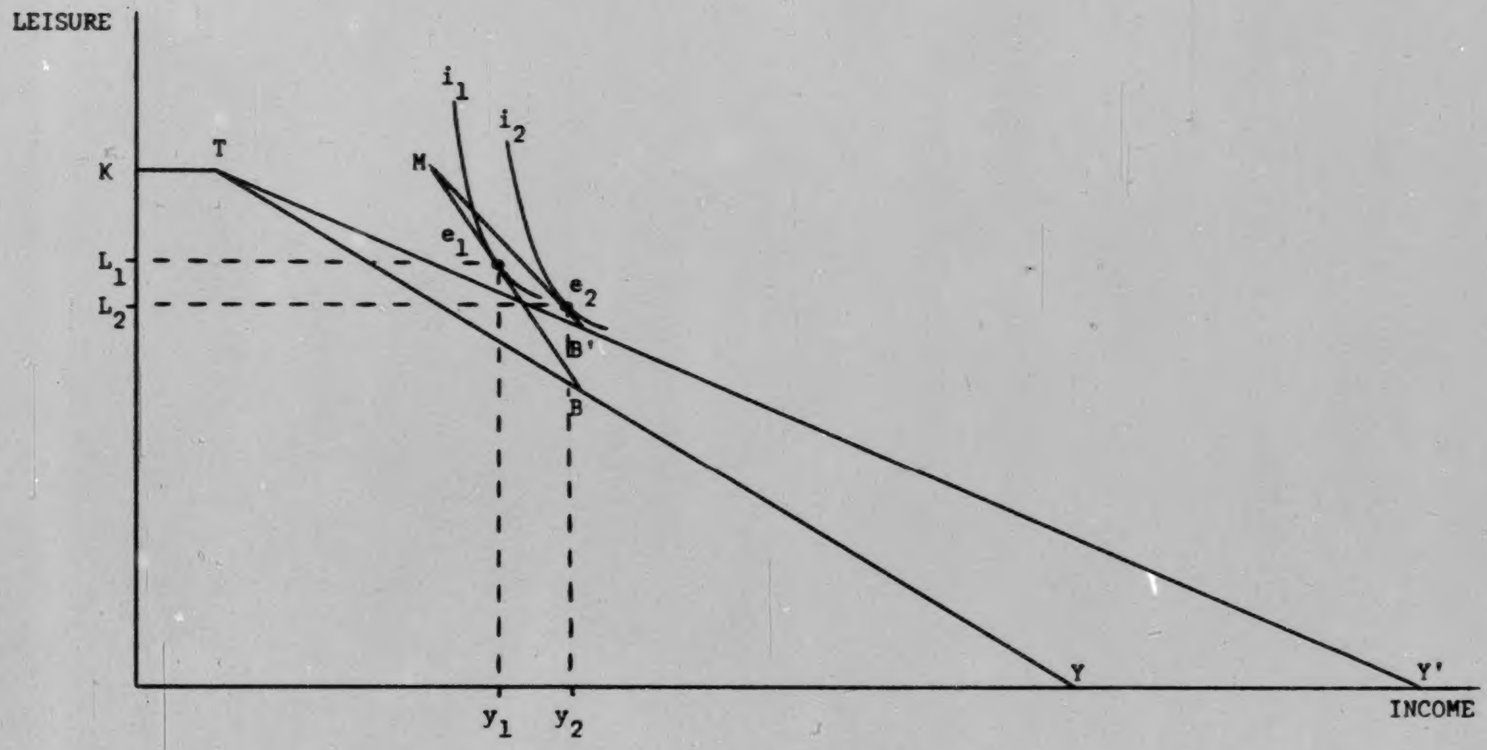
LEISURE
K
T
L_1
L_2
M
i_1
i_2
e_1
e_2
B'
B
Y
Y'
y_1
y_2
INCOME

FIGURE 4

are different from those of New York or Houston. Therefore, even if it were possible from a financial standpoint to perform an experiment that would take the actions of the aggregate labor market into consideration, before we could draw an implication for a national negative income tax we would have to argue that all labor markets are the same.

Besides the major theoretical flaw of ignoring the effect of aggregate labor markets, the experiments have several other questionable aspects:

(1) Because of the costs involved in performing one of these experiments, only a segment of the total work force is singled out for study. That is, only families that have a prime aged, male head are studied, and families with aged or female heads are ignored along with unrelated individuals. It is questionable whether conclusions, however limited, for male heads of households could be extended to other segments of the labor force.

(2) There seems to be some problem in selecting from an area a random sample of participants which represents the racial composition of the actual population of poor. That is, we know that over half the poor are white, but in one of the experiments only 13 percent of the participants were white. It is a known fact that a significant differential exists between the wage rates and unemployment rates of whites versus nonwhites, and so the racial composition of the participants raises serious questions about the validity of generalizing from experimental results to national policy considerations. It seems doubtful

if any one city or rural area in the country could provide a random sample of the poor that approximated the racial, educational, occupational, etc. characteristics of the poor population as a whole.

3) The possibility exists that Hawthorne Effects may be present which would bias the results.[14]

The Scope of This Study

As was stated above, the objective of this study is to test and measure the disincentive effects of negative income taxation. With the previous studies and current social experiments in mind, we will try to avoid the major problems previously encountered. Therefore, we will design the procedures for testing and measuring the disincentive effects in such a way that:

(1) All subgroups of the male labor force will be included.[15] Besides including the basic group of white, prime aged, married males, this work will include young and old married, white males, and white, unmarried males of all ages. In addition, a similar breakdown of the nonwhite male labor force is included in the study. And, whenever feasible, these subgroups are further subdivided according to manufacturing versus nonmanfacturing type of worker.

---

[14] For a description of Hawthorne Effects, see Guy H. Orcutt and Alice G. Orcutt, "Incentive and Disincentive Experimentation for Income Maintenance Policy Purposes," American Economic Review, Vol. 58 (September, 1968), 759-761.

[15] The reason why the study is restricted to the male labor force is discussed in Chapter 4.

(2) The study will first single out one proxy variable--namely the legislated unemployment compensation rate--and show why it is a theoretically sound surrogate for the negative income tax rate. It will further show that the various lump-sum, non-employment income variables used in the past to measure disincentive effects are wholly unsatisfactory in that they measure only one part of the disincentive effect of negative income taxation. Also, the legislated unemployment compensation rate is especially well suited for empirical work since it is uncorrelated with any of the actions of the individual. Therefore, there is little question in interpreting which way the causality runs, which can be a major problem when the policy variable can be influenced by the actions of the individual.

(3) Information regarding the individual's particular labor market is explicitly considered. That is, the effect of the demand side of the labor market on work effort of the individual will be considered, and, hence, the major limitation of the social experiments will be overcome.

(4) The data used in this study comes from a scientifically drawn sample of the nation's population.

CHAPTER 2: THEORY

This chapter presents a simple model for negative income taxation that is used to derive, in as concise a form as possible, many of the conclusions set forth by recent verbal arguments over the disincentive effects of negative taxation on work effort.[1] Also, the simplicity of the model in this chapter serves as a convenient reference for the slightly more cumbersome mathematics in the next chapter. We will first specify a simple model that includes positive and negative income taxation as well as transfer income. The next part of the chapter contains an intuitive discussion of the similarities between the effects of positive and negative taxation, points out the fundamental difference between the two, and explains why the incentive effect of negative taxation is unambiguously negative. The intuitive discussion is followed by a more formal mathematical derivation of the same conclusions reached on a heuristic level. Finally, we will derive the familiar Slutsky equation, identify its component parts (i.e., the substitution and "income" effects), and show why both the substitution and "income" effects are negative. By the inclusion of transfer income (which has only an "income" effect) in the model, we are able to see the importance of keeping pure transfer income separate from income subsidies based on earned income.

Before we begin, it is well to preface the mathematics with an admission of the inherent limitation of such analysis. The calculus derivations are basically of a static nature. In effect, we are saying that if we change this variable another variable changes in a certain way--we do not describe the time path of that change. It is a recognized fact that such *ceteris paribus* experimentation ignores the myriad of interactions between variables that we know will take place in the real world. When dealing with poverty and negative taxation it is even more important to keep these limitations of such static analysis in mind.

---

[1] For example, see Green and Tella, "Effect of Nonemployment Income and Wage Rates on the Work Incentives of the Poor," 399-401.

By definition, we are trying to do something that will lift people out of poverty. Motivating this effort is a desire to break the circle of poverty whereby a poor person is ill-fed, poorly educated, low-paid, and poverty is passed on from generation to generation. It is hoped that by bringing people over the poverty line they will be able to better feed, clothe, and educate themselves, and, as a result, seek out and obtain work at better and higher paying jobs.[2] That is, it is hoped that a negative income taxation scheme will contain a self-obsolescing mechanism. It was the original aim of the war on poverty to do just this (i.e., not merely alleviate the pain of poverty by treating the symptoms of poverty, but cure the underlying causes of poverty). The statistics of the last chapter show that the war on poverty has not been successful at producing anything like a lasting cure for poverty. The fact that many well-intentioned anti-poverty programs of the sixties served, at best, as stop-gap measures is one of the reasons why plans as drastic as income transfer schemes are gaining so much attention. Therefore, the analysis below is prefaced by the thought that, if a negative income tax succeeds in lifting substantial numbers out of poverty, we will not find ourselves in a ceteris paribus world.

---

[2] For example, see Boskin, "The Negative Income Tax and the Supply of Work Effort," 355-357.

The Simple Work Effort Model with Taxes

We start with a simple, well-behaved, utility function whose arguments are leisure (L) and disposable income (Y)--

$$U = U(L,Y). \qquad [1]$$

We make the usual assumptions regarding the sign of the first and second derivatives[3] of the utility function. That is, we assume that U_L, $U_Y > 0$ and U_{LL}, $U_{YY} < 0$ which follows from the definition of leisure and income as normal goods with positive, but diminishing, marginal utility. In addition we assume that the cross partial derivatives, U_{LY} and U_{YL}, are positive.[4]

We know that there is a one-to-one inverse relationship between leisure and work (W) such that $K = L + W$, or

$$L = f(W), \qquad [2]$$

where K = total time available for work or leisure, and the derivative $L_W = f' = -1$. The fact that $L_W = -1$ follows from the fact that, given any measure of time, an increase in leisure by one unit necessarily means a decrease in work by one unit.

Including both a positive income tax rate (t) and a negative income tax rate (r) in the definition of disposable income,[5] we have

---

[3] First, second, and cross partial derivatives of a function are denoted by subscripts.

[4] We will return to examine the importance and implication of this assumption when we examine the signs of the uncompensated and compensated effects of negative taxation.

[3] $$Y = Ww - tWw + r(B-Ww-T) - tr(B-Ww-T) + T - tT,$$

where w = wage rate, B = breakeven point in the negative tax scheme, and T = pure transfer income. (We have implicitly assumed that $B > Ww + T$ so that the person qualifies for the negative tax.) Rearranging terms in [3] we can write

[4] $$Y = (1-t)[(1-r)(Ww+T) + rB].$$

We are now in a position to substitute [2] and [4] into [1] and set up the following function:

[5] $$U = U\{f(W),(1-t)[(1-r)(Ww+T) + rB]\}.$$

Taking the derivative of [5] with respect to W we have

[6] $$U_W = -U_L + U_Y(1-t)(1-r)w = 0$$

$$U_L = U_Y(1-t)(1-r)w$$

[7] $$\frac{U_L}{U_Y} = w(1-t)(1-r),$$

which is the normal necessary first order condition for utility maximization of a utility function whose arguments are leisure and income. Equation [7] states that the ratio of marginal utilities equals the wage rate, net of transfers and taxes.

The Difference Between Positive and Negative Taxation

Simple examination of [7] shows that as the positive or negative tax rate increases the right-hand side decreases. In order to be in equilibrium the ratio of marginal utilities on the left-hand side will also have to decrease. A decrease in the ratio can come about in three ways: (1) the marginal utility of leisure can decrease, (2) the marginal utility of income can increase, or (3) the marginal utility of leisure can decrease and the marginal utility of income can increase. A very important distinction must be made between the positive and negative income tax rates as they appear in [7]. An increase in either the positive or negative tax rate has the effect of reducing the net wage rate. But, when the positive tax rate is increased, the disposable income will be reduced and our usual assumptions about the marginal utility of income lead us to say that the marginal utility of income has increased. The negative tax rate differs from the positive tax rate at this critical point. When the negative tax rate increases, disposable income will increase and our usual assumptions will produce a decrease in the marginal utility of income. Thus, assuming the usual condition of diminishing marginal utility of income, we can *a priori* rule out the last two ways of reducing the ratio of marginal utilities and we are left only with the first, i.e., a decrease in the marginal utility of leisure. Again, if we assume leisure to be a normal good, this can come about only through an increase in leisure, i.e., a decrease in work effort.

---

[5] The inclusion of both t and r in the model is done mainly for expository purposes. If the reader feels uncomfortable with this, he may think of negative income taxation on the federal level and positive income taxation on the state and local level.

The Disincentive Effect of Negative Income Taxation

Adopting a more rigorous approach, we can establish that the derivative dW/dr is negative, i.e., that as the negative tax rate increases, work effort decreases. We can derive this by noting that a sufficient condition for a maximization requires that the second order conditions be negative.

Rewriting equation [6] we have

[8] $$U_W = -U_L + U_Y(1-t)(1-r)w = 0,$$

where U_L and U_Y are themselves functions of f(W) and Y. Differentiating [8] again with respect to W gives

[9] $$U_{WW} = U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2 < 0,$$

as a sufficient condition for utility maximization. The total derivative of [8] (holding the wage rate, positive tax rate, and transfer income fixed, i.e., dw=dt=dT=0) would be

[10] $$dW\{U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2\}$$
$$= -dr\{(1-t)(Ww+T-B)[U_{LY}-U_{YY}w(1-t)(1-r)] - w(1-t)U_Y\}.$$

Dividing both sides of [10] by dr and multiplying through by dW/dr we obtain

[11] $$\{U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2\}\left[\frac{dW}{dr}\right]^2$$
$$= -\frac{dW}{dr}\left\{(1-t)(Ww+T-B)[U_{LY}-U_{YY}w(1-t)(1-r)] - w(1-t)U_Y\right\}.$$

From our assumptions and the sufficient conditions for a maximization, we know that U_{YY} and the term in braces on the left-hand side of [11] are negative. We have also assumed that U_Y and U_{LY} are positive, and it is readily seen that w, (1-t), and (1-r) are all positive. And, we have assumed that (Ww+T-B) is negative. It is now easily verified that the entire left-hand side of [11] is negative and the term in braces on the right-hand side is negative. Therefore, given our assumptions, dW/dr must be negative. That is, the uncompensated effect of a change in the negative income tax rate produces disincentives with regard to work effort.[6]

---

[6] It is well to note at this point that, if $U_{LY} < 0$, the sign of dW/dr (uncompensated) is in some doubt unless we know the specific magnitudes of these cross partials. The exact role of U_{LY} will be examined below.

The Substitution and Transfer Income Effects

In order to derive the Slutsky equation we begin by totally differentiating [6] to produce

$$\begin{aligned}
&dW\{U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2\} \\
&+ dr\{(1-t)(Ww+T-B)[U_{LY} - U_{YY}w(1-t)(1-r)] - w(1-t)U_Y\} \\
&- dT\{(1-t)(1-r)[U_{LY} - U_{YY}w(1-t)(1-r)]\} \\
[12] \quad &+ dw\{(1-t)(1-r)[-U_{LY}W + U_{YY}Ww(1-t)(1-r) + U_Y]\} \\
&+ dt\{U_{LY}[(1-r)(Ww+T) + rB] - U_{YY}w(1-t)(1-r)[(1-r)(Ww+T) + rB] \\
&\qquad - w(1-r)U_Y\} \\
&+ dB\{r(1-t)[-U_{LY} + U_{YY}w(1-t)(1-r)]\} = 0.
\end{aligned}$$

Solving for $\partial W/\partial r$ and $\partial W/\partial T$ we have

$$[13] \quad \frac{\partial W}{\partial r} = \frac{w(1-t)U_Y}{A} - \frac{(1-t)(Ww+T-B)[U_{LY} - U_{YY}w(1-t)(1-r)]}{A}$$

$$[14] \quad \frac{\partial W}{\partial T} = \frac{(1-t)(1-r)[U_{LY} - U_{YY}w(1-t)(1-r)]}{A},$$

where $A = \{U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2\}$.

Equation [14] is the usual form of the income effect of the Slutsky equation. However, $\partial W/\partial T$ is an "income" effect with respect to a specific form of income, namely, transfer income. Therefore, [14] should be interpreted as the "transfer income" effect and the previous use of quotation marks around income should now be clear. From now on we will explicitly use the term transfer income effect to keep the meaning clear. Substituting [14] into [13] we have

$$[15] \quad \frac{\partial W}{\partial r} = \frac{w(1-t)U_Y}{A} - \frac{(Ww+T-B)}{(1-r)}\frac{\partial W}{\partial T}.$$

To derive the substitution effect, we first totally differentiate the utility function holding utility constant

$$\begin{aligned} dU = {} & -U_L dW + U_Y(1-t)(1-r)w dW + U_Y W(1-t)(1-r)dw \\ & + U_Y(1-t)(B-Ww-T)dr - U_Y[(1-r)(Ww+T) + rB]dt \\ & + U_Y(1-t)(1-r)dT + U_Y r(1-t)dB = 0 \end{aligned}$$

$$\frac{U_L}{U_Y} = (1-t)(1-r)w + \frac{M}{dW} , \tag{16}$$

where $M = \{W(1-t)(1-r)dw + (1-t)(B-Ww-T)dr - [(1-r)(Ww+T) + rB]dt + (1-t)(1-r)dT + r(1-t)dB\}$. From [7] and [16] we have that $M = 0$ when utility is maximized. Expanding [12] and rearranging terms we have

$$\begin{aligned} & dW\{U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2\} \\ & - drU_Y w(1-t) + dwU_Y(1-t)(1-r) - dtU_Y(1-r)w \\ & - U_{LY}M + U_{YY}w(1-t)(1-r)M = 0. \end{aligned} \tag{17}$$

The last two terms on the left-hand side of the equation are zero. Therefore, we can write

$$\begin{aligned} & dW\{U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2\} \\ & - drU_Y w(1-t) + dwU_Y(1-t)(1-r) - dtU_Y w(1-r) = 0 \end{aligned} \tag{18}$$

when utility is held constant. Equation [18] implies that

$$\left.\frac{\partial W}{\partial r}\right|_{U=\bar{U}} = \frac{w(1-t)U_Y}{A} . \tag{19}$$

Equations [15] and [19] taken together yield

$$\frac{\partial W}{\partial r} = \left.\frac{\partial W}{\partial r}\right|_{U=\bar{U}} - \frac{(Ww+T-B)}{(1-r)}\frac{\partial W}{\partial T} . \tag{20}$$

By definition, w, $(1-t)$, and $(1-r)$ are positive. For the person to qualify for a negative tax, $B > Ww + T$ which gives $(Ww+T-B) < 0$. We have assumed U_Y and U_{LY} are positive and U_{LL} and U_{YY} are negative. Therefore, we have

$$U_{LY} - U_{YY}w(1-t)(1-r) > 0$$

$$A = U_{LL} - 2U_{LY}w(1-t)(1-r) + U_{YY}[w(1-t)(1-r)]^2 < 0.$$

Thus, the substitution and transfer income effects are both negative and the entire change in work effort with respect to the negative tax rate is negative:[7]

$$\frac{\partial W}{\partial r} = \frac{w(1-t)U_Y}{A} - \frac{(1-t)(Ww+T-B)[U_{LY} - U_{YY}w(1-t)(1-r)]}{A}$$

$$= \frac{(+)(+)(+)}{(-)} - \frac{(+)(-)(+)}{(-)}$$

$$= \quad (-) \quad - \quad (+) \quad < 0.$$

It would seem clear that, on theoretical grounds, an increase in the negative tax rate would have the effect of reducing work effort. However, two further qualifications (besides those mentioned earlier) should be kept in mind when working through such analysis: (1) the purpose of the negative income tax is not to stimulate work effort, but rather to redistribute income,[8] and (2) the calculus admits to only infinitesimal changes in the negative tax rate and not to the considerable discontinuous change that would result from the imposition of a negative tax scheme. The above analysis only hints at what the effects on work effort would be in going from the present welfare payments (with their means tests that impose as high as a 100 percent tax on earned income), to a negative income tax scheme with a 50 percent tax on earned income. Also, the "unambiguous" nature of the theoretical results, founded on the standard assumptions and analyses of consumer theory, provides us with an ideal situation for confronting theoretical assumptions with empirical evidence--it will be seen later whether the behavior of people justifies the economist's theory about them.

---

[7] The importance of the assumption that $U_{LY} > 0$ should now be clear. If $U_{LY} < 0$, and of a sufficient magnitude, then the signs of A and $[U_{LY} - U_{YY}w(1-t)(1-r)]$ could change and possibly produce a positive transfer income effect and $\partial W/\partial r$ could be positive. Thus, U_{LY} is capable of producing a pathological case similar to Giffen goods in the standard analysis.

[8] For a discussion of the conflict between these goals, see Klaus P. Kisker, "A Note on the Negative Income Tax," National Tax Journal, Vol. 20 (March, 1967), 102-105.

CHAPTER 3: REDUCED FORM

In this chapter we will derive the basic form of the reduced form equation to be used later in the empirical estimation. The derivation below serves as a bridge between the theory of the last chapter and the next chapter which discusses the data actually used in the empirical estimation. Here we will firm up our theory by specifying more concrete definitions for work, leisure, and wage rate. We will introduce the basic proxy variable (the unemployment compensation rate) to be used to represent the effect of negative income taxation. The introduction of the unemployment compensation rate into the model in place of the negative income tax serves the purpose of establishing its place in the reduced form equation and showing the similarity between its effect on work effort and that of the negative income tax rate. That is, it was shown in the last chapter that the negative income tax rate carries both a substitution and transfer income effect, and this chapter shows how the unemployment compensation rate can be manipulated to yield a substitution and transfer income effect. Also, we will drop positive income taxation from the model and, hence, are able to replace the disposable income variable with a simpler variable representing a Hicksian good.

The Basic Model Including the Proxy Variable

It is particularly important to establish the theoretical suitability of the unemployment compensation rate as a proxy variable for the negative income tax rate since, again, no data exists for negative income taxation.

That is, there is no empirical way to establish which of the many possible non-employment income variables is the best proxy for the negative income tax rate. To establish empirically (e.g., through principal component analysis) that a particular variable is a "good" proxy for a negative tax scheme would require the existence of negative income tax data, and in such a case it would seem of questionable value to even pursue a proxy variable when the variable of real interest is extant.[1] Therefore, our selection of the unemployment compensation rate as a proxy variable has to be based on theoretical arguments rather than empirical tests.

To begin with, let

K = total time available to a person to spend in labor market activities (i.e., time available for actual work and/or time spent unemployed)

W = work effort of the person (e.g., hours worked in a year)

S = unemployment time of the person

L = leisure of the person

R = earned income of the person

w = effective wage rate of the person ($w = R/W$)

Y = legislated unemployment compensation benefits (weekly benefits/average hours worked per week by the person)

y = legislated unemployment compensation rate ($y = Y/w$)

T = transfer income (e.g., unearned income)

C = Hicksian composite good whose price is unity.

To derive a basic reduced form equation, we will use the standard utility maximization problem where the basic unit of consideration is a utility maximizing individual, where his utility is a function of leisure and the Hicksian composite good. Hence, the individual's utility function would be

---

[1] Of course, there could be statistical reasons that would make the use of a proxy variable necessary (e.g., multicollinearity), but such possibilities are, unfortunately, only distant specters at this point in time.

$$U = U(L,C) = U(K-W-S,C),$$

where

$$C = R + YS + T = Ww + ywS + T.$$

Substituting, we have the following function

[1] $U = U(K-W-S, Ww + ywS + T)$.

Taking the derivatives of U in equation [1] with respect to the endogenous variables (W and S), we obtain the following necessary first order conditions for a maximization:[2]

[2.1] $U_W = -U_L + U_C w = 0$

[2.2] $U_S = -U_L + U_C yw = 0$.

We can now implicitly differentiate [2.1] and [2.2]. We first take the total differential of the two first order conditions and rearrange to obtain

[3.1]
$$dW[U_{LL}-2U_{LC}w+U_{CC}w^2] + dS[U_{LL}-U_{LC}yw-U_{CL}w+U_{CC}yw^2]$$
$$= dw[U_{LC}(W+yS)-U_{CC}(W+yS)w-U_C] + dy[U_{LC}wS-U_{CC}w^2S] + dT[U_{LC}-U_{CC}w]$$

[3.2]
$$dW[U_{LL}-U_{LC}w-U_{CL}yw+U_{CC}yw^2] + dS[U_{LL}-2U_{LC}yw+U_{CC}y^2w^2]$$
$$= dw[U_{LC}(W+yS)-U_{CC}(W+yS)yw-U_Cy] + dy[U_{LC}wS-U_{CC}w^2yS-U_Cw]$$
$$+ dT[U_{LC}-U_{CC}yw].$$

We now divide each term in [3.1] and [3.2] by the partial derivative of w, y, and T. That is, we divide each of the equations by ∂w, ∂y, and ∂T to produce a total of six equations. For example, dividing [3.1] and [3.2] by ∂w produces:

---

[2] It is assumed that the utility function is well-behaved and that the sufficient conditions for a maximum hold.

$$[3.1.1]\qquad \frac{\partial W}{\partial w}[U_{LL}-2U_{LC}w+U_{CC}w^2] + \frac{\partial S}{\partial w}[U_{LL}-U_{LC}yw-U_{CL}w+U_{CC}yw^2] = [U_{LC}(W+yS)-U_{CC}(W+yS)w-U_C]$$

$$[3.2.1]\qquad \frac{\partial W}{\partial w}[U_{LL}-U_{LC}w-U_{CL}yw+U_{CC}yw^2] + \frac{\partial S}{\partial w}[U_{LL}-2U_{LC}yw+U_{CC}y^2w^2] = [U_{LC}(W+yS)-U_{CC}(W+yS)yw-U_Cy].$$

Rearranging [3.1.1] and [3.2.1] in matrix notation we have

$$[4.1]\qquad [E]\begin{bmatrix}\frac{\partial W}{\partial w}\\ \frac{\partial S}{\partial w}\end{bmatrix} = \begin{bmatrix}[U_{LC}(W+yS)-U_{CC}(W+yS)w-U_C]\\ [U_{LC}(W+yS)-U_{CC}(W+yS)yw-U_Cy]\end{bmatrix},$$

where

$$[E] = \begin{bmatrix}[U_{LL}-2U_{LC}w+U_{CC}w^2] & [U_{LL}-U_{LC}yw-U_{CL}w+U_{CC}yw^2]\\ [U_{LL}-U_{LC}w-U_{CL}yw+U_{CC}yw^2] & [U_{LL}-2U_{LC}yw+U_{CC}y^2w^2]\end{bmatrix}.$$

Similarly, for ∂y and ∂T we obtain

$$[4.2]\qquad [E]\begin{bmatrix}\frac{\partial W}{\partial y}\\ \frac{\partial S}{\partial y}\end{bmatrix} = \begin{bmatrix}[U_{LC}wS-U_{CC}w^2S]\\ [U_{LC}wS-U_{CC}w^2yS-U_Cw]\end{bmatrix}$$

$$[4.3]\qquad [E]\begin{bmatrix}\frac{\partial W}{\partial T}\\ \frac{\partial S}{\partial T}\end{bmatrix} = \begin{bmatrix}[U_{LC}-U_{CC}w]\\ [U_{LL}-U_{CC}yw]\end{bmatrix}.$$

To solve for the partial derivative of a change in the work effort variable with respect to one of the exogenous variables, we select the relevant system of equations from [4.1] through [4.3] and use Cramer's rule. For example, if we want $\partial W/\partial w$, we would use [4.1] to obtain

$$[5]\qquad \frac{\partial W}{\partial w} = \frac{[U_{LC}(W+yS)-U_{CC}(W+yS)w-U_C]D_{11}}{D} + \frac{[U_{LC}(W+yS)-U_{CC}(W+yS)yw-U_Cy]D_{21}}{D},$$

where D is the determinant of matrix E, and D_{ef} is the cofactor of the (e,f) element of E. Similarly, for $\partial W/\partial y$ and $\partial W/\partial T$ we have

$$[6] \qquad \frac{\partial W}{\partial y} = \frac{[U_{LC}wS-U_{CC}w^2S]D_{11}}{D} + \frac{[U_{LC}wS-U_{CC}w^2yS-U_Cw]D_{21}}{D}$$

$$[7] \qquad \frac{\partial W}{\partial T} = \frac{[U_{LC}-U_{CC}w]D_{11}}{D} + \frac{[U_{LC}-U_{CC}yw]D_{21}}{D} .$$

Expanding [6] and rearranging terms we have

$$[8] \qquad \frac{\partial W}{\partial y} = wS \left\{ \frac{[U_{LC}-U_{CC}w]D_{11}}{D} + \frac{[U_{LC}-U_{CC}wy]D_{21}}{D} \right\} - \frac{U_CwD_{21}}{D} .$$

Substituting [7] into [8] we obtain

$$[9] \qquad \frac{\partial W}{\partial y} = - \frac{U_CwD_{21}}{D} + wS \frac{\partial W}{\partial T} .$$

Equation [9] is the familiar form of the Slutsky equation.[3] To derive the substitution effect we totally differentiate the utility function, holding utility constant, to obtain

$$[10] \qquad dU = dW(-U_L+U_Cw) + dS(-U_L+U_Cyw) + dwU_C(W+yS) + dyU_CwS + dTU_C = 0.$$

From [2.1] and [2.2] we have

$$dwU_C(W+yS) + dyU_CwS + dTU_C = 0$$

$$U_C[dw(W+yS)+dywS+dT] = 0.$$

Since $U_C > 0$, $[dw(W+yS)+dywS+dT] = 0$. Expanding [3.1] and [3.2] and collecting terms we obtain

$$[11.1] \qquad dW[U_{LL}-2U_{LC}w+U_{CC}w^2] + dS[U_{LL}-U_{LC}yw-U_{CL}w+U_{CC}yw^2]$$
$$= -U_Cdw + [dw(W+yS) + dywS + dT][U_{LC} - U_{CC}w]$$

$$[11.2] \qquad dW[U_{LL}-U_{LC}w-U_{CL}yw+U_{CC}yw^2] + dS[U_{LL}-2U_{LC}yw+U_{CC}y^2w^2]$$
$$= -U_C[ydw + wdy] + [dw(W+yS) + dywS + dT][U_{LC} - U_{CC}yw].$$

---

[3] Note that pure transfer income is the one exogenous variable that only has a transfer income effect.

From above, we have that when utility is held constant

$$[12.1] \qquad dW[U_{LL}-2U_{LC}w+U_{CC}w^2] + dS[U_{LL}-U_{LC}yw-U_{CL}w+U_{CC}yw^2] = -U_C dw$$

$$[12.2] \qquad dW[U_{LL}-U_{LC}w-U_{CL}yw+U_{CC}yw^2] + dS[U_{LL}-2U_{LC}yw+U_{CC}y^2w^2] = -U_C ydw - U_C wdy.$$

Or, dividing through by ∂w and ∂y and rewriting we have

$$[13] \qquad [E]\begin{bmatrix} \frac{\partial W}{\partial w} \\ \frac{\partial S}{\partial w} \end{bmatrix} = \begin{bmatrix} -U_C \\ -U_C y \end{bmatrix} \qquad [E]\begin{bmatrix} \frac{\partial W}{\partial y} \\ \frac{\partial S}{\partial y} \end{bmatrix} = \begin{bmatrix} 0 \\ -U_C w \end{bmatrix}.$$

Solving for ∂W/∂y we obtain

$$[14] \qquad \left.\frac{\partial W}{\partial y}\right|_{U=\bar{U}} = \frac{-U_C w D_{21}}{D}$$

which is the usual expression for the substitution effect. Equations [9] and [14] taken together yield the standard Slutsky equation--

$$\frac{\partial W}{\partial y} = \left.\frac{\partial W}{\partial y}\right|_{U=\bar{U}} + wS\,\frac{\partial W}{\partial T}\,.$$

Therefore, the legislated unemployment compensation rate carries with it a substitution and transfer income effect.

The Reduced Form Equation

To derive the basic reduced form equation, we note that the total change in an endogenous variable can be expressed as the sum of partial changes due to the exogenous variables. For example, work effort is potentially influenced by the three exogenous variables--w, y, and T. Or,

$$[15] \qquad dW = \frac{\partial W}{\partial w}\,dw + \frac{\partial W}{\partial y}\,dy + \frac{\partial W}{\partial T}\,dT.$$

Remembering that the partial derivatives of equation [15] are Slutsky equations which are functions of the equilibrium values of the endogenous variables and exogenous variables and can be treated as constants, we can integrate this equation to produce

$$W = B_0 + \frac{\partial W}{\partial w} w + \frac{\partial W}{\partial y} y + \frac{\partial W}{\partial T} T,$$

where B_0 is a constant of integration.[4] Therefore, the basic reduced form equation that can be used for estimation would be

$$[16] \qquad W = \hat{\beta}_0 + \hat{\beta}_1 w + \hat{\beta}_2 y + \hat{\beta}_3 T + e,$$

where the $\hat{\beta}$'s are the estimated coefficients and e the residual.[5]

Interpretation of the Coefficients of the Reduced Form

Three important points, which may have been lost in the mathematics, should be explicitly mentioned.

(1) From [6] we saw that the unemployment compensation rate of the person carried with it a substitution and transfer income effect.

(2) Comparing [6] of this chapter with equation [14] of the previous chapter demonstrates that the effect of the unemployment compensation rate on work effort is very similar to the effect of the negative income tax rate.

---

[4] It is somewhat of a heroic assumption that the Slutsky terms are constants over the entire range of values. Ideally, we would like to stop with [15] where we have a linear relationship between the change in work effort and changes in the exogenous variables. However, since it is only possible to obtain data on the one period levels of these variables, we are forced to take the next step and make the assumption of constancy and integrate to obtain a linear relationship in terms of levels.

[5] This reduced form equation is a special variant of the standard labor supply equation to be found in most labor supply models (see Malcolm Cohen, Samuel Rea, and Robert Lerman, A Micro Model of Labor Supply (Washington, D.C.: Government Printing Office, 1970), 184-186).

(3) From [7] we see that transfer income only has a transfer income effect.

The first two of these points provide the theoretical justification for using the unemployment compensation rate as a proxy variable for the negative income tax rate, and identify the coefficient in the regression equation which will be estimating the uncompensated effect of the negative income tax rate. That is, from [16] we see that $\hat{\beta}_2$, the coefficient of the person's unemployment compensation rate, should be an estimate of the effect of the negative income tax rate on work effort. Further, if our theory is correct, we can a priori predict that $\hat{\beta}_2$ will be negative.[6] The third point is valuable because it means that we can easily obtain an estimate of the substitution effect by itself. That is, we have that $\hat{\beta}_2$ will estimate the combined effect of the substitution and transfer income effect of the unemployment compensation rate--the unemployment compensation rate serving as a proxy for the negative income tax rate. Thus,

$$[17] \qquad \hat{\beta}_2 = wS \left\{ \frac{[U_{LC} - U_{CC}w]D_{11}}{D} + \frac{[U_{LC} - U_{CC}wy]D_{21}}{D} \right\} - \frac{-U_C w D_{21}}{D}.$$

We also have that

$$\hat{\beta}_3 = \frac{[U_{LC} - U_{CC}w]D_{11}}{D} + \frac{[U_{LC} - U_{CC}yw]D_{21}}{D} ,$$

from which we can solve for the transfer income effect of equation [17]--

---

[6] The variable y is a rate of compensation for non-work, relative to the individual's rate of compensation for work. That is, if the statutory unemployment benefits that an individual can collect are \$100 per week and his wage is \$200 per week, y of the individual would be 0.5. Thus, if the individual elected not to work he would receive half his normal income. In so far as there are disincentives attached to payments for non-work, we would expect the larger the y the less work an individual would perform--$\hat{\beta}_2$ would be negative.

$$[18] \qquad wS\left\{\frac{[U_{LC}-U_{CC}w]D_{11}}{D}+\frac{[U_{LC}-U_{CC}yw]D_{21}}{D}\right\}=wS\hat{\beta}_3.$$

Substituting [18] into [17], it follows immediately that

$$\hat{\beta}_2 - wS\hat{\beta}_3 = -\frac{U_C wD_{21}}{D},$$

where

$$-\frac{U_C wD_{21}}{D}$$

is the substitution effect of the unemployment compensation rate which, again, is proxying the negative income tax rate. Therefore, we should be able to obtain estimates of the substitution and transfer income effects of negative income taxation on work effort. The reliability of these estimates will be a function of the statistical significance of $\hat{\beta}_2$ and $\hat{\beta}_3$ and the extent to which the unemployment compensation rate proxies the negative income tax rate.

Consideration of Macro-Economic Variables

A question could be raised here about the rather parsimonious inclusion of variables in equation [16]. Clearly, many more variables influence an individual in deciding how much to work and these variables should be included in any meaningful attempt to explain work effort. The additional variables which should be included in the regression model are of two types. First, there is the usual assortment of demographic variables which can be used to control for systematic differences between different demographic groups. (These include age, sex, race, etc.) Secondly, and, for our purposes, more importantly, macro-economic variables should be included. (These comprise such variables as the local unemployment rate, capital labor ratio in the industry, etc.) The inclusion of these two categories of variables implies that the original micro-economic utility function for the individual looked like

$$U = U(L,y;\ \text{tastes};\ \text{macro-economic variables}).$$

We explicitly left out the taste variables since it is beyond the realm of economic theory to measure *a priori* or discuss how an individual's tastes will affect his rational decision-making process. Since we do not have any way to measure tastes, the next best answer for handling them is to try controlling for them by either stratifying the population according to demographic characteristics or including dummy variables for demographic characteristics. In so far as tastes systematically vary according to demographic groups, we will be successful in controlling for tastes.

The possible inclusion of macro-economic variables is more interesting, since, by definition, they have an economic significance of their own. Measures of the macro-economic variables are readily available from various sources and it is fairly straightforward to provide an *a priori* argument as to how they will affect the individual's rational decision-making process. For example, the aggregate unemployment rate in an individual's labor market can easily be obtained from several different sources, e.g., various state and/or federal agencies. Furthermore, a reasonable argument can be put forward that as the unemployment rate increases, the individual will find it harder and harder to exercise complete freedom in selecting his optimal amount of leisure (i.e., work). However, as far as the individual is concerned, the unemployment rate in his labor market is a given fact. Therefore, the inclusion of a macro-economic variable (either in the objective function or a constraint), while being economically pertinent, will be regarded as a constant to the micro-economic unit and not appear in any optimization decision.

For example, consider the very simple case where there are neither taxes (positive or negative) nor transfer income. The individual can be thought to maximize his utility (which is a function of leisure and income) by reaching the highest indifference curve that is just tangent to his "budget constraint." In this case, however, the "budget constraint" represents a locus of all possible combinations of income and leisure. In Figure 5 we have drawn indifference curve i_1 tangent to opportunity locus LY at point R. As drawn, we have showed the person to be in equilibrium with 2000 hours of leisure (i.e., 2000 hours of work) and $4000 of income per year. We have also drawn LY to extend completely between OL and OY. This implicitly assumes that the person can spend all of his available time working (i.e., leisure can be zero) and earn $8000. As depicted, the individual rationally decided not to spend all of his time working.

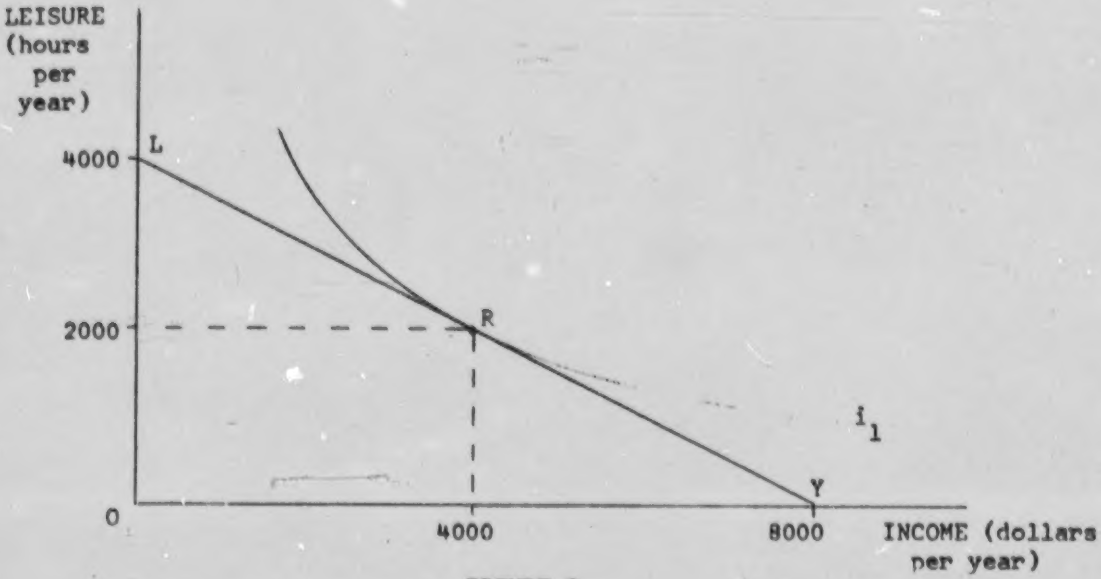

FIGURE 5

What would happen if the individual were not free to work as many hours per year as he wanted? It can easily be argued that there are many institutional reasons that prevent individuals from working as many hours as they want and that there are also basic physiological considerations that prevent a man or woman from working every waking moment. All that aside, however, there are economic reasons that could prevent a person from working as much as he wanted. Perry has recently demonstrated that for workers in the same basic demographic (age and sex) group the amount of time they can expect to be idle due to aggregate employment conditions can vary considerably.[7] That is, the number of periods of unemployment during a year and the average length of unemployment during each spell will vary depending upon the aggregate unemployment rate. For example, a male worker between the ages of 20 to 24 could expect to be unemployed 2.92 weeks a year when the unemployment rate is 3 percent (spells of unemployment = 0.73 and duration = 4.0 weeks) and 5.05 weeks when the unemployment rate is 6 percent (spells of unemployment = 0.91 and duration = 5.1 weeks).[8] Thus, for the average 22 year-old male worker the difference between a tight labor market (aggregate unemployment = 3%) and a slack labor market (aggregate unemployment = 6%) is a little over 2 weeks of actual unemployment. This implies that if an individual were in a labor market, subject to unemployment, even if he were to remain constantly in the labor market he could expect to be unemployed several weeks of the year. And, as the aggregate unemployment rate increases, the individual can expect to be idle for more and longer periods of time. As far as the analysis is concerned, the opportunity locus would be truncated as shown in Figure 6 (LY').

---

[7] George L. Perry, "Unemployment Flows in the U.S. Labor Market," Brookings Papers on Economic Activity, No. 2 (1972), 245-278.

[8] Ibid., 259.

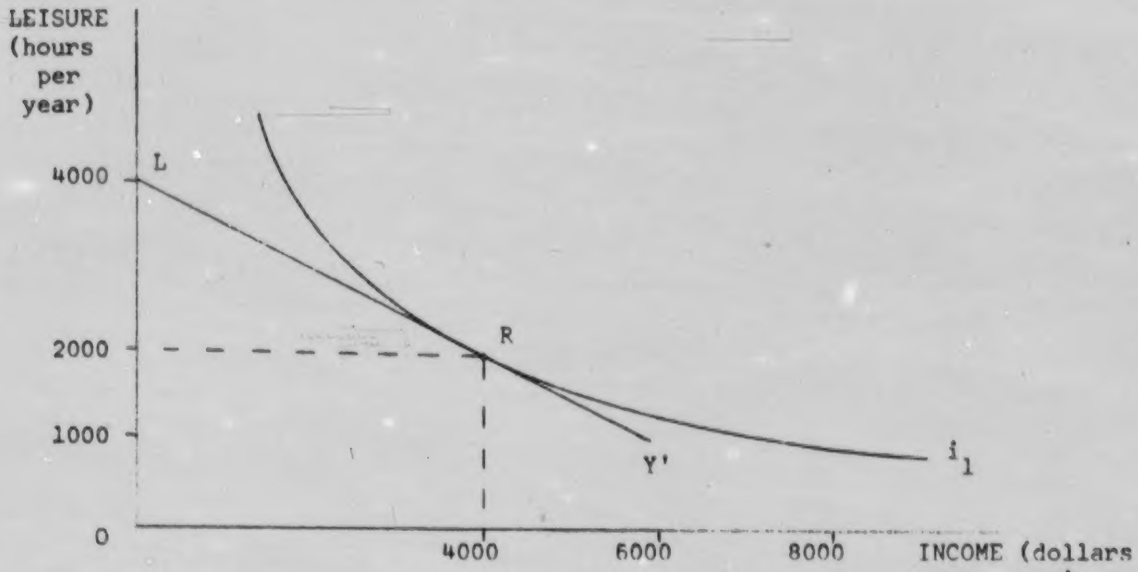

FIGURE 6

That is, there are some combinations of income and leisure which are not possible for the individual to obtain. In Figure 6, the individual is forced to accept 1000 hours of leisure due to labor market conditions. However, the individual depicted in Figure 6 is not affected by the truncation of the opportunity locus and he can still reach an optimum by following the normal micro-economic theory rules of optimization.

What if the labor market conditions, such as many periods of unemployment, a long duration of unemployment, or low wages, were to impose severe limitations on the possibilities open to an individual? Clearly, there would be a very real possibility that the individual would not be able to reach an equilibrium position. Consider Figure 7 where the opportunity locus of leisure and income is now very truncated (LY"). Even

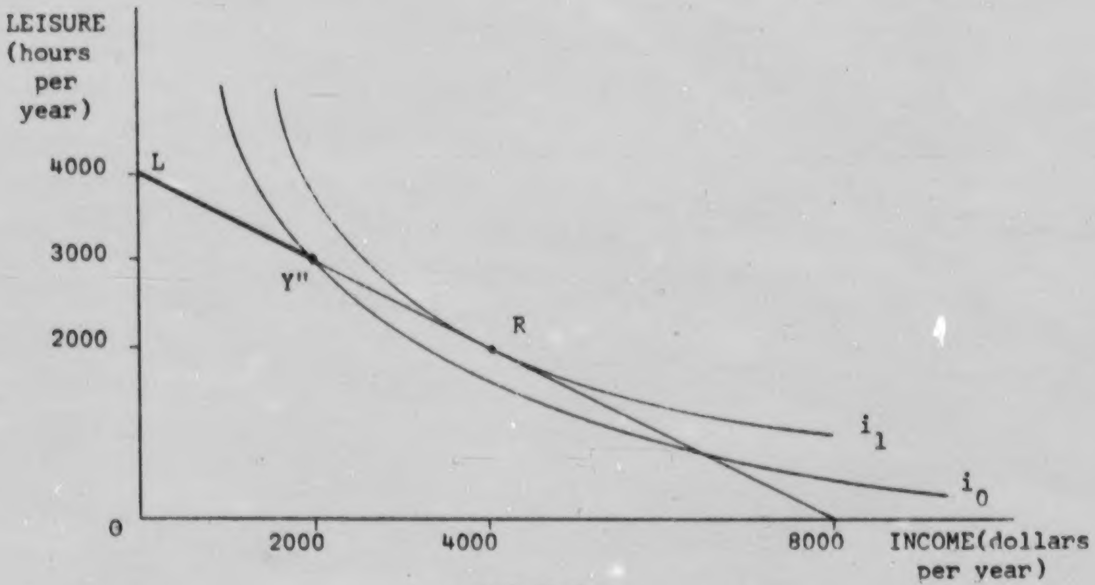

FIGURE 7

if the individual constantly remained in the labor market he would be forced to accept 3000 hours of leisure (i.e., there is a maximum of 1000 hours of work available to him). The individual would be forced into a sub-optimal position of achieving less than the maximum utility (i_0 versus i_1) by working 1000 hours and receiving $2000 in income. This type of a situation may not be unrealistic for a significant portion of the poor. Thus, as the labor market weakens and the locus of possibilities shrinks, it would seem that the individual is forced to accept more and more leisure, i.e., less work.

Similarly, reasonable arguments could be put forward that various industrial characteristics (e.g., percent of unionization or profit per worker, etc.) or occupational variables (e.g., whether or not the individual is in a secondary type of occupation) have some effect on the work decision of the individual. Thus, the basic reduced form equation of [16] could be written in a more general form as

[19] $$W = \hat{\beta}_0 + \hat{\beta}_1 w + \hat{\beta}_2 y + \hat{\beta}_3 T + \Sigma\hat{\beta}_i X_i + e,$$

where the X_i's are demographic, industrial, occupational, and labor market variables.

CHAPTER 4: THE DATA

In this chapter we will present a brief description of the data used in the empirical estimation along with a discussion of how the data was modified to make it suitable for estimation purposes.

Description of the Data

The basic data set used in the empirical work of this study comes from the March 1967 Current Population Survey (CPS).[1] Briefly, the CPS is a monthly survey of 50,000 households in the United States conducted by the Bureau of the Census. More than 100,000 persons over the age of 14 are included in the survey every month. The primary purpose of the survey is to provide basic information on the labor force status of the population on a continuing basis between the decennial census. Information is gathered on various demographic characteristics of the individuals (age, sex, race, marital status, etc.) along with information on their labor force status (industry, occupation, hours worked, etc.). During some months, additional questions are asked of the participating individuals with regard to certain other areas. For example, in the March questionnaire, a supplemental section is added to the basic questionnaire dealing with the person's income by type and amount. Thus, the March 1967 CPS data set contains current demographic information on the person, data on the individual's March 1967 labor force status, and information on his or her 1966 income and hours and weeks worked in 1966.[2]

---

[1] I am greatly indebted to Malcolm S. Cohen of the Labor Market Information System Project, Institute of Labor and Industrial Relations, for providing me with this data.

In order to obtain a data set which would be useful for this study, the basic CPS data set had to be modified in two ways. First, while the original data set contained information on some 104,845 observations (persons), not all of these observations could be used, so it was necessary to eliminate a great number of observations from consideration (the observations eliminated and the reason for their elimination are discussed below). Secondly, it was necessary to merge onto the basic CPS data set some additional variables that could possibly prove to be important to the individual's work decision. In addition to these two major modifications, it was necessary to recode some of the variables contained on the CPS data. For a list of the variables finally selected for this study, see Table 4.

Selection of Individuals to be Studied

The elimination of observations was undertaken for two reasons. First, some people would not be likely to qualify for, or participate in, a negative income tax scheme if it were adopted, and so it was necessary to exclude these people. The individuals eliminated on this basis included unpaid workers, anyone less than 21 years of age, anyone over 65 years of age, and anyone who listed his or her major activity as "school." The second category of people eliminated included those whose record did not contain sufficient information to be useful. The largest group of observations excluded here were those people who did not live in one of the largest 93 Standard

---

[2] For a more detailed description of the Current Population Survey, see U.S. Department of Commerce, Bureau of the Census, The Current Population Survey: A Report on Methodology, Technical Paper No. 7 (Washington, D.C.: Government Printing Office, 1963).

TABLE 4: LIST OF VARIABLES

Personal Variables:

- Age
- Race
- Sex
- Veteran Status (males only)
- Marital Status
- Household Relationship
- Years of School Attended

Location and Labor Market Variables:

- Region of the Country
- 1966 SMSA Unemployment Rate
- Change in SMSA Unemployment Rate between 1965 and 1966

Occupational Variables:

- 1960 Percent of Nonwhite Workers in the Occupation
- 1960 Percent of Female Workers in the Occupation
- 1960 Percent of Nonwhite Male Workers in the Occupation
- 1960 Percent of Nonwhite Female Workers in the Occupation
- Secondary Occupation Dummy on Race (more than 125% of national average of nonwhites in the occupation)
- Secondary Occupation Dummy on Sex (more than 125% of national average of females in the occupation)

Industrial Variables:

- Individual's Industry
- 1966 Business Receipts per Worker in the Industry
- 1966 Profit per Worker in the Industry
- 1966 Percent of Female Workers in the Industry
- Percent Unionization of the Industry
- 1966 Estimate of the Percent of Total Business Receipts of the Industry Accounted for by the Industry's 10 Largest Firms
- 1966 Depreciable Corporate Assets per Worker in the Industry
- 1966 Annual Average Weekly Overtime of Production Workers (manufacturing only)
- 1966 Annual Average of Layoffs per 100 Production Workers (manufacturing only)

Work Effort Variables:

- Estimate of Weeks Worked during 1966
- Average Hours Worked per Week during 1966
- Total Hours Supplied during 1966

- continued -

TABLE 4: LIST OF VARIABLES (continued)

Income Variables:

- Wage and Salary Income
- Self-Employed Income
- Unearned Income
- Total Earned Income
- Total Income of Other Family Members and Own Unearned Income
- Individual's Total Income

Unemployment Compensation Variable:

- Weekly Unemployment Compensation Benefits

Metropolitan Statistical Areas (SMSA) in the United States. Without information on the individual's SMSA or residence, it would be impossible to add onto the individual's record any information about his or her local labor market and it would be impossible to calculate what the person's unemployment compensation benefits would be which is an essential variable.[3] Approximately one-half of the 104,845 observations were excluded for not having detailed SMSA information. The next group eliminated from the CPS data set were those who had no work experience during 1966 and/or who were not in the labor force in March of 1967. The records for these people did not contain work effort variables (weeks or hours worked) for 1966 and/or did not contain information on the individual's industry or occupation as of March 1967. Thus, it would be impossible to include these people in a study of work effort since they lack either the necessary dependent variable (work effort) or many of the possibly important variables (industry and occupation information). By excluding anyone who did not have both work experience in 1966 and current labor force status in March 1967, it was reasonable to assume that the remaining workers were in the labor force throughout 1966.[4] Unfortunately, however, the female labor force had enough workers who go in and out of the labor force so that this assumption could not be sustained and female workers had to be eliminated. It was also necessary to exclude some young, non-married male workers on similar grounds. Also excluded were those persons who individually had income in excess of $15,000. It was necessary to exclude these people because, due to the coding of the income variables, it was impossible to obtain an accurate estimate of the individual's income. Having made all of these deletions, the basic data set contained 15,544 observations on male individuals between the ages of 21 and 65 who lived in the 93 largest SMSA's, had some work experience during 1966, and were in the labor force as of March 1967.

---

[3] The original data set contained 97 codes for detailed SMSA of residence. However, it was necessary to eliminate four of the smaller SMSA's (Fort Lauderdale-Hollywood, Orlando, Bakersfield, and Tucson) since they are not in the top 150 labor market areas which precluded adding labor market information (see below).

[4] The version of the CPS data used in this study did not contain information on the time an individual was in the labor force. Thus, to be able to calculate the individual's unemployment time it was necessary to make the assumption of constant labor force participation. This would allow weeks worked to be subtracted from total weeks available in the year to estimate weeks unemployed. However, if a person did not remain in the labor force constantly, subtracting weeks worked from the weeks in the year would overestimate the unemployment time. It appears that constant labor force participation of females is not a good assumption.

After reducing the number of observations, the next step was to merge onto this still very large, micro cross section data set additional variables pertaining to the individual's occupation, industry, and local labor market. Since the study aims primarily at measuring how an individual adjusts his work effort in response to some sort of transfer program that bases its payments on the person's earnings, it was considered necessary to include variables that might possibly help to control for involuntary adjustments made by the individual in his work effort due to either local labor market conditions or systematic variations attributable to particular industries or occupations.

Addition of Labor Market Variables

As mentioned above, the CPS data set contains information on which of the largest SMSA's, if any, an individual lives in (see Table 5). From the Manpower Report of the President, 1968,[5] which contains information

---

[5] U.S., Department of Labor, Manpower Report of the President, 1968 (Washington, D.C.: Government Printing Office, April, 1968).

TABLE 5: LABOR MARKET VARIABLES

CPS Code No.	Standard Metropolitan Statistical Area	Average Unemployment Rate 1966	Change in Unemployment Rate (1965-1966)
1	New York, N.Y.	4.1	-0.4
2	Los Angeles-Long Beach, Calif.	4.5	-1.2
3	Chicago, Ill.	3.0	-0.5
4	Philadelphia, Pa.-N.J.	3.3	-1.0
5	Detroit, Mich.	3.3	-0.2
6	San Francisco-Oakland, Calif.	4.4	-0.6
7	Boston, Mass.	3.6	-0.4
8	Pittsburgh, Pa.	3.0	-0.6
9	St. Louis, Mo.-Ill.	3.2	-0.3
10	Washington, D.C.-Md.-Va.	2.4	-0.2
11	Cleveland, Ohio	2.6	-0.5
12	Baltimore, Md.	2.9	-1.0
13	Newark, N.J.	4.1	-0.5
14	Minneapolis-St. Paul, Minn.	2.2	-0.6
15	Buffalo, N.Y.	3.9	-0.5
16	Houston, Texas	2.4	-0.8
17	Milwaukee, Wis.	2.3	-0.4
18	Paterson-Clifton-Passaic, N.J.	4.3	-0.8
19	Seattle-Everett, Wash.	3.0	-1.8
20	Cincinnati, Ohio-Ky.-Ind.	3.0	-1.0
21	Dallas, Texas	2.4	-0.9
22	Kansas City, Mo.-Kans.	4.0	-0.5
23	San Diego, Calif.	5.2	-2.0
24	Atlanta, Ga.	2.8	0.1
25	Indianapolis, Ind.	2.1	-0.4
26	Miami, Fla.	3.5	-0.4
27	Denver, Colo.	3.2	-0.3
28	New Orleans, La.	3.3	-0.7
29	Portland, Oreg.-Wash.	3.4	-0.6
30	Providence-Pawtucket-Warwick, R.I.-Mass.	3.8	-1.0
31	San Bernardino-Riverside-Ontario, Calif.	6.2	-0.5
32	Tampa, St. Petersburg, Fla.	2.4	-0.4
33	Louisville, Ky.-Ind.	3.0	-0.5
34	Dayton, Ohio	2.4	-0.4
35	San Antonio, Texas	4.3	-1.4
36	Columbus, Ohio	2.5	-0.3
37	Phoenix, Ariz.	3.3	-1.4
38	Albany-Schenectady-Troy, N.Y.	3.2	-0.3
39	San Jose, Calif.	4.8	-1.2
40	Birmingham, Ala.	4.1	-0.1
41	Memphis, Tenn.-Ark.	2.9	-0.8
42	Jersey City, N.J.	4.4	-0.8
43	Rochester, N.Y.	2.3	-0.6
44	Norfolk-Portsmouth, Va.	2.8	-0.4
45	Gary-Hammond-East Chicago, Ill.-Ind.	2.7	-0.5
46	Fort Worth, Texas	2.9	-0.9
47	Syracuse, N.Y.	2.9	-0.8
48	Hartford, Conn.	2.5	-0.5

- continued -

TABLE 5: LABOR MARKET VARIABLES (continued)

CPS Code No.	Standard Metropolitan Statistcal Area	Average Unemployment Rate 1966	Change in Unemployment Rate (1965-1966)
49	Akron, Ohio	2.6	-0.6
50	Oklahoma City, Okla.	3.2	-0.4
51	Youngstown-Warren, Ohio	3.5	-0.4
52	Sacramento, Calif.	5.2	-0.6
53	Honolulu, Hawaii	3.0	-0.3
54	Allentown-Bethelehem-Easton, Pa.-N.J.	2.2	-0.6
55	Springfield-Chicopee-Holyoke, Mass.-Conn.	4.3	-1.1
56	Omaha, Nebr.-Iowa	3.0	-0.4
57	Toledo, Ohio-Mich.	3.1	-0.5
58	Jacksonville, Fla.	2.2	-0.4
59	Greensboro-Winston-Salem-High Point, N.C.	2.7	0.0
60	Tulsa, Okla.	3.4	-0.5
61	Richmond, Va.	1.8	-0.1
62	Nashville, Tenn.	2.4	-0.5
63	Salt Lake City, Utah	4.0	-1.0
64	Flint, Mich.	3.4	0.7
65	Knoxville, Tenn.	2.7	-0.3
66	Wilmington, Del.-N.J.-Md.	2.9	-0.1
67	Fresno, Calif.	6.6	-0.7
68	Grand Rapids, Mich.	3.2	0.4
69	Wilkes-Barre-Hazelton, Pa.	4.8	-1.5
70	Harrisburg, Pa.	2.4	-0.5
71	Wichita, Kans.	2.7	-1.4
72	Canton, Ohio	2.9	-0.6
73	Bridgeport, Conn.	3.5	-1.2
75	Utica-Rome, N.Y.	4.3	-1.1
76	Worchester, Mass.	3.9	-0.6
77	Tacoma, Wash.	4.4	-1.2
79	Mobile, Ala.	4.4	0.0
80	El Paso, Texas	4.4	-1.4
81	New Haven, Conn.	3.2	-0.2
82	Beaumont-Port Arthur-Orange, Texas	4.0	-1.3
83	Lansing, Mich.	2.4	0.2
85	Peoria, Ill.	3.0	-0.2
86	Chattanooga, Tenn.-Ga.	2.9	-0.6
87	Shreveport, La.	3.2	-0.9
88	Johnstown, Pa.	4.6	-1.1
89	Lancaster, Pa.	1.5	-0.4
90	Spokane, Wash.	4.5	-0.6
91	Duluth-Superior, Minn.-Wis.	4.4	-1.2
92	Reading, Pa.	1.6	-0.6
93	Charlotte, N.C.	3.1	-0.1
94	Davenport-Rock Island-Moline, Iowa-Ill.	2.6	-0.3
95	Trenton, N.J.	3.7	-0.3
96	Des Moines, Iowa	1.8	-0.2

Source: U.S., Department of Labor, Manpower Report of the President, 1968 (Washington, D.C.: Government Printing Office, April, 1968).

on the nations's 150 largest labor market areas, it was a fairly straightforward matter to obtain the 1966 annual average unemployment rate in the individual's SMSA. It was also possible to calculate the difference between the 1965 and 1966 unemployment rates for the SMSA's and obtain the change in unemployment rates for the SMSA's. Thus, besides the 1966 level of unemployment, we have an indication of whether the unemployment situation was worsening or getting better in the individual's locality.

Addition of Occupational Variables

The CPS data set lists 37 occupational categories (see Table 6).[6] From the Occupational Characteristics,[7] various characteristics of the occupational categories were calculated. Of primary concern here were variables that dealt with the sex and racial composition of the individual's occupation. It was felt that, for one reason or another, the work opportunities of nonwhites may be subject to exogenous constraints beyond the individual's control, and that it may well prove significant to be able to control for any systematic differences in the work opportunities in occupations that are related to sex or race. From Table 6, it is obvious that there is considerable variation in the percentage of women and nonwhites in the various occupations, with women and nonwhites making up a disproportionately larger share of the work force in the less desirable occupations. Because of this, two dummy variables were constructed out of the occupational variables on the basis of whether or not the individual's

---

[6] Since we have excluded all persons not living in one of the 93 largest SMSA's, the agricultural occupational categories are superfluous.

[7] U.S., Department of Commerce, Bureau of the Census, U.S. Census of the Population, PC(2)-7A, Occupational Characteristics (Washington, D.C.: Government Printing Office, 1963).

TABLE 6: OCCUPATIONAL VARIABLES

CPS Code Number	Occupational Title	1960 Percent Nonwhite	1960 Percent Female	1960 Percent Nonwhite-Male	1960 Percent Nonwhite-Female
1	Engineers, technical	1.43	0.90	1.41	0.03
2	Medical and other health workers (salaried)	6.48	77.93	1.33	5.15
3	Medical and other health workers (self-emp.)	4.33	18.18	3.12	1.21
4	Teachers, except college	8.56	65.17	2.08	6.48
5	Other professional, technical and kindred (salaried)	2.62	24.50	1.25	1.37
6	Other professional, technical and kindred (self-emp., retail)	1.53	12.05	1.22	0.31
7	Farmers and farm managers	7.82	3.95	7.11	0.71
8	Managers, officials and proprietors (salaried)	1.56	13.22	1.15	0.41
9	Managers, officials and proprietors (self-emp., retail)	3.67	18.30	2.41	1.26
10	Managers, officials and proprietors (self-emp., not retail)	2.93	10.88	2.53	0.40
11	Stenographers, typists, and secretaries	3.32	96.51	0.21	3.11
12	Other clerical and kindred workers	5.22	58.21	2.92	2.30
13	Sales workers (retail)	2.81	54.04	1.30	1.51
14	Sales workers (not retail)	1.93	13.28	1.47	0.46
15	Carpenters	5.37	0.33	5.33	0.04
16	Construction, craftsmen, except carpenters	7.12	0.88	7.03	0.09
17	Foremen (nec)	1.99	6.81	1.74	0.25
18	Machinists and job setters	2.94	1.40	2.83	0.11
19	Mechanics and repairmen (automobile)	7.50	0.36	7.45	0.05

- continued -

TABLE 6: OCCUPATIONAL VARIABLES (continued)

CPS Code Number	Occupational Title	1960 Percent Nonwhite	1960 Percent Female	1960 Percent Nonwhite-Male	1960 Percent Nonwhite-Female
20	Mechanics and repairmen (not automobile)	5.62	1.54	5.48	0.14
21	Metal craftsmen except machinists and mechanics	6.99	2.24	6.74	0.25
22	Other craftsmen and kindred workers	3.55	6.15	3.05	0.50
23	Drivers and delivery men	13.38	0.94	13.26	0.12
24	Mine operatives and laborers	5.04	0.43	4.99	0.05
25	Operatives, motor vehicle and equip. mfg.	14.50	10.20	13.22	1.28
26	Operatives, other durable goods	9.20	22.23	7.58	1.62
27	Operatives, nondurable goods manufacturing	10.07	41.43	5.79	4.28
28	Operatives, nonmanufacturing industry	11.23	36.26	7.12	4.11
29	Private household workers	53.85	96.46	1.71	52.14
30	Protective service workers	4.58	4.02	4.12	0.46
31	Waiters, cooks, and bartenders	14.79	70.24	6.18	8.61
32	Other service workers	26.72	53.77	13.57	13.15
33	Farm laborers and foremen (paid)	28.08	11.41	22.09	5.99
34	Farm laborers and foremen (unpaid)	13.38	44.42	7.72	5.66
35	Laborers, construction	27.37	0.67	27.08	0.29
36	Laborers, manufacturing	23.81	6.62	22.73	1.08
37	Laborers, other industries	26.52	3.26	25.50	1.02

Source: U.S., Department of Commerce, Bureau of the Census, U.S. Census of the Population, PC (2)-7A, Occupational Characteristics (Washington, D.C.: Government Printing Office, 1963).

occupation contained a disproportionately large percentage of women or nonwhites. That is, if the individual's occupation contained more than 125 percent of the national average of nonwhites or women, it was assigned the value of "1," if not it was assigned the value of "0."[8]

Addition of Industrial Variables

Similarly, the CPS data set has 44 industrial categories (Table 7). From the Employment and Earning Statistics for the United States: 1909-1968,[9] it was possible to obtain an annual average of the total number of employees and number of female employees in a particular industry for 1966. From the Business Income Tax Returns: Statistics of Income 1966,[10] and the previous information, estimates of the business receipts and profit per worker were obtained. Also, from the Business Income Tax Returns: Statistics of Income 1966, it was possible to calculate an estimate of the total industry's business receipts that were accounted for by the 10 largest firms in the industry, along with the depreciable corporate assets per worker in the industry. And, from Employment and Earning Statistics for the United States: 1909-1968, the average weekly overtime for production workers in manufacturing and the layoff rate for manufacturing production workers were obtained (see Table 8). Finally, from Fuch's The Service

---

[8] On the basis of race, if the occupation contained more than 12.75% nonwhite, it was assigned the value of "1." On the basis of sex, if the occupation contained more than 40.875% female, it was assigned the value of "1."

[9] U.S., Department of Labor, Bureau of Labor Statistics, Employment and Earning Statistics for the United States: 1909-1968, Bulletin 1312-6 (Washington, D.C.: Government Printing Office, August, 1968).

[10] U.S., Department of the Treasury, Internal Revenue Service, Business Income Tax Returns: Statistics of Income 1966 (Washington, D.C.: Government Printing Office, March, 1969).

TABLE 7: INDUSTRIAL VARIABLES (manufacturing industries only)

CPS Code Number	Industry	1966 Business Receipts per Worker (thousands)	1966 Profit per Worker (thousands)	1966 Percent Female in Industry	1966 Percent Unionization	Percent of 1966 Business Receipts by the 10 Largest Firms
5	Lumber	19.96	1.07	8.38	20.66	23.66
6	Furniture	17.13	1.00	20.04	29.00	8.50
7	Stone	20.82	1.60	15.65	30.24	30.52
8	Primary metals	31.39	2.65	6.28	73.79	22.94
9	Fabricated metals	23.83	1.88	16.95	52.46	20.54
10	Machinery except electrical	24.02	2.94	13.46	47.84	18.67
11	Electrical machinery	20.98	1.73	40.49	52.00	32.78
12	Automobiles	57.70	6.40	8.58	71.00	71.84
13	Transportation (other)	22.70	1.24	11.75	49.09	42.98
14	Instruments	22.38	3.38	35.30	35.98	45.68
15	Miscellaneous manufacturing	22.40	1.58	43.92	50.55	15.66
16	Food and kindred establishments	49.26	2.04	24.94	47.79	10.82
17	Textile mills	19.76	1.09	44.37	35.90	16.46
18	Apparel	14.64	0.55	79.75	51.74	7.24
19	Printing and publishing	20.76	2.00	29.99	41.11	10.84
20	Chemical	45.61	5.55	19.31	38.02	16.61
21	Other nondurables	24.38	1.86	14.81	47.57	64.38

Sources: U.S., Department of Labor, Bureau of Labor Statistics, *Employment and Earning Statistics for the United States, 1909-68*, Bulletin 1312-6 (Washington, D.C.: Government Printing Office, August, 1968); U.S., Department of the Treasury, Internal Revenue Service, *Business Income Tax Returns: Statistics of Income, 1966* (Washington, D.C.: Government Printing Office, March, 1969); and Victor Fuchs, *The Service Economy*, National Bureau of Economic Research (New York: Columbia University Press, 1968), 252-258.

TABLE 8: INDUSTRIAL VARIABLES (manufacturing industries only)

CPS Code Number	Industry	1966 Annual Average Weekly Overtime of Production Workers	1966 Annual Average of Layoffs per 100 Production Workers	1966 Depreciable Corporate Assets per Worker (thousands)
5	Lumber	4.0	1.6	7.84
6	Furniture	3.8	0.8	3.37
7	Stone	4.5	1.3	16.56
8	Primary metals	4.0	0.6	26.40
9	Fabricated metals	4.5	1.2	7.40
10	Machinery except electrical	5.5	0.5	8.90
11	Electrical machinery	3.3	0.5	5.45
12	Automobiles	4.9	3.2	20.12
13	Transportation (other)	4.5	1.2	6.55
14	Instruments	3.7	0.4	9.00
15	Miscellaneous manufacturing	3.0	2.1	4.88
16	Food and kindred establishments	4.0	2.8	12.38
17	Textile mills	4.4	0.7	7.55
18	Apparel	1.5	2.0	1.38
19	Printing and publishing	3.5	0.7	6.98
20	Chemical	3.3	0.6	29.63
21	Other nondurables	4.2	0.8	18.35

Sources: U.S., Department of Labor, Bureau of Labor Statistics, Employment and Earning Statistics for the United States, 1909-68, Bulletin 1312-6 (Washington, D.C.: Government Printing Office, August, 1968), and U.S., Department of the Treasury, Internal Revenue Service, Business Income Tax Returns: Statistics of Income, 1966 (Washington, D.C.: Government Printing Office, March, 1969).

Economy,[11] data on the percent of workers unionized in an industry was obtained. Again, these industry characteristic variables were merged onto the files of the individuals on the assumption that there may be systematic differences between the job opportunities for different industries which are beyond the control of an individual in that industry. That is, the worker has no control over the demand side of the labor market and yet such aspects as the industry's layoff rate can have a significant bearing on the amount of work an individual can perform. Or, alternatively, since the demand for labor is a derived demand based on the demand for the industry's output, measures of the sales or profits of the industry might be important. And, since the work decision of an individual is influenced, to a greater or lesser degree, by the negotiated settlements of labor unions and large companies in the industry, some measure of the significance of labor unions in the industry and monopoly power of firms was thought appropriate.

From Tables 7 and 8 it is apparent that these variables only exist for manufacturing industries. For example it is impossible to find information for the "welfare and religious services industry," and it would be nonsensical to talk about business receipts for the government. And, as already mentioned above, it is only possible to find overtime and layoff figures for the manufacturing industries.

Addition of Unemployment Compensation Benefits

The last variable added to the CPS data set was the person's weekly unemployment compensation benefits. From the Comparison of State Unemployment

---

[11] Victor Fuchs, The Service Economy, National Bureau of Economic Research (New York: Columbia University Press, 1968), 252-258.

Insurance Laws,[12] it was possible to obtain the formula used by the various states in 1966 in calculating unemployment compensation benefits. By using the relevant information from the individual's CPS record (weeks worked, income, number of dependents, etc.), a fairly accurate estimate of the particular individual's benefits could be obtained.

Recoding of Some Variables

Finally, some of the data on the CPS data set were in the form of interval values. For example, for the various types of income, there were 18 intervals such as $1-$499, $500-$999, etc. In order to be able to use these variables, it was necessary to convert these intervals into a form more suitable for empirical work. The income intervals were converted to their midpoint values, i.e., the value assigned to the interval $1-$499 was $250. Similarly, it was necessary to convert the various educational variables into one variable that represents the number of years of school attended.

---

[12] U.S., Department of Labor, Employment Security Bureau, Comparison of State Unemployment Insurance Laws, Revision 1, Series 1 (Washington, D.C.: Government Printing Office, August, 1966).

CHAPTER 5: EMPIRICAL RESULTS

In this chapter we will discuss how the male labor force was stratified into eight basic subgroups and further subdivided to give as fine a breakdown of the male labor force as is feasible. The exact econometric procedure employed in the empirical analysis will then be described and followed by an example which serves as a bridge between the theoretically derived reduced form equation of Chapter 3 and the empirical results presented in this chapter. Finally, a summary of the empirical results for 46 subgroups will be presented in tabular form along with an interpretation of those results.

Stratifying the Observations

The first step was to stratify the total population (15,544 observations) into various subgroups according to region of the country, marital status, and race. There were eight basic subgroups (Table 9). In addition, each subgroup would usually be further subdivided into three age categories: young workers (21 to 29 years old), prime aged workers (30 to 50 years old), and older workers (51 to 65 years old). However, if any age category for one of the subgroups did not contain at least 50 observations it would not be included in the analysis. Further, whenever possible an age category would be broken down into manufacturing and nonmanufacturing types of workers. This, again, would only be done when there were sufficient observations to warrant the further stratification by industry type. For example, for the first subgroup, which contains approximately half of the

TABLE 9: STRATIFICATION CHARACTERISTICS FOR THE VARIOUS SUBGROUPS

Subgroup Number	Region of Country	Marital Status	Race	Number of Subdivisions
1	Non-South	Married	White	9
2	Non-South	Married	Nonwhite	9
3	Non-South	Unmarried	White	9
4	Non-South	Unmarried	Nonwhite	2
5	South	Married	White	9
6	South	Married	Nonwhite	5
7	South	Unmarried	White	2
8	South	Unmarried	Nonwhite	1

male workers, we would have nine subdivisions below the subgroup:

$$\text{Subgroup 1} = \begin{array}{c}\text{Non-South}\\ \text{Married}\\ \text{White}\end{array} \left\{ \begin{array}{ll} \text{Young} & \left\{ \begin{array}{c}\text{All Workers}\\ \text{Manufacturing}\\ \text{Nonmanufacturing}\end{array}\right. \\ \text{Prime Aged} & \left\{ \begin{array}{c}\text{All Workers}\\ \text{Manufacturing}\\ \text{Nonmanufacturing}\end{array}\right. \\ \text{Old} & \left\{ \begin{array}{c}\text{All Workers}\\ \text{Manufacturing}\\ \text{Nonmanufacturing}\end{array}\right. \end{array}\right.$$

But, for the eighth subgroup we have only one subdivision:

$$\text{Subgroup 8} = \begin{array}{c}\text{South}\\ \text{Unmarried}\\ \text{Nonwhite}\end{array} \left\{ \text{Prime Aged} \quad \left\{ \quad \text{All Workers} \right.\right.$$

In all, there were 46 subdivisions.

Estimation Procedure: Two Stage Least Squares

Before we get into any of the empirical results, we should restate the basic reduced form equation from the end of Chapter 3:

$$W = \hat{\beta}_0 + \hat{\beta}_1 w + \hat{\beta}_2 y + \hat{\beta}_3 T + \Sigma \hat{\beta}_i X_i + e \qquad [1]$$

where

W = total hours worked per year

w = wage rate

y = unemployment compensation rate (proxy for the negative income tax rate)

T = unearned income

X_i = labor market, industrial, occupational, and demographic variables

e = residual

A problem immediately arises in that the wage rate (w) is calculated by dividing total earnings by total hours worked (W). This means that the wage rate is jointly determined by the exogenous variables and the disturbance terms. Thus, the wage rate is not truly exogenous and independent of the disturbance terms. In order to use the standard linear regression model, the explanatory variables have to be stochastically independent of the system so that we may treat them as constants. Therefore, the standard linear model cannot be used to estimate equation [1] as it presently stands.[1] The most direct method for resolving the problem of trying to enter a jointly determined endogenous variable as an explanatory variable is to replace the variable in question with another variable which is independent of the disturbance terms. The standard procedure for doing this is to use two stage least squares.[2] That is, first regress the jointly determined variable, in this case the wage rate, on the exogenous variables (i.e., the demographic, labor market, industrial, and occupational variables) and use the calculated values of the jointly determined endogenous variable in the original equation. In the present situation, we should first regress w on the exogenous variables and use the calculated values for the wage rate in the equation for total hours worked. Thus, our reduced form equation for total hours worked becomes

$$[2] \qquad W = \hat{\beta}_0 + \hat{\beta}_1 \hat{w} + \hat{\beta}_2 y + \hat{\beta}_3 T + \Sigma \hat{\beta}_i X_i + e$$

where $\hat{w}$ is an estimate of the wage rate found by regressing w on the exogenous demographic, labor market, industrial and occupational variables. Therefore, for each of the 46 subgroups it was first necessary to calculate an estimated wage rate using the exogenous variables and then estimate an equation for total hours worked.

---

[1] See J. Johnston, Econometric Methods (2nd ed., New York: McGraw-Hill Book Company, 1972), 381; and, Henri Theil, Principles of Econometrics (New York: John Wiley & Sons, Inc., 1971), 429-437.

[2] See Johnston, Econometric Methods, 380-384.

The Proxy Variable and "Unearned Income"

Having obtained an estimate of the wage rate, the next step was to calculate the unemployment compensation rate. This consisted of forming a ratio of the individual's weekly unemployment benefits to what he could expect to earn if employed. The calculation of the individual's weekly unemployment compensation benefits was described in the last chapter, and the estimate of how much an individual could expect to earn if employed was found by multiplying the individual's estimated wage rate by the average hours worked per week for the particular subgroup. For example, if an individual could collect, say, \$36.00 per week in unemployment compensation benefits based on his income, number of dependents, etc., and he had an estimated wage rate of \$2.00 and was in a subgroup that had an average hours worked per week of 45.0 hours, we would have

$$y = \frac{\$36.00}{(\$2.00)\cdot(45.0)} = 0.40.$$

From Chapters 2 and 3 it should be intuitive that as y increases (i.e., as the payment for unemployment increases relative to the rate of compensation for work) the individual should want to reduce the amount of work he does.

One further note on the general nature of the labor supply equation concerns the definition of "unearned income." From Chapters 2 and 3 we have a rather amorphous concept of what constitutes unearned income to an individual. In general, unearned income should be income available to the individual for the satisfaction of his wants, but unrelated to the amount of work effort performed by the individual. Obviously, most individuals will have some amount of unearned income from dividends, interest, etc. However, individuals who live in a family unit will also have available to them the income (earned and unearned) of other family members. This income of the other family members can be used, to a greater or lesser extent to be sure, for the individual's satisfaction and is unrelated to his work effort. Therefore, there are two possible definitions of unearned income. The narrower definition would include only that unearned income that directly accrues to the individual. The broader definition would add to the individual's own unearned income, the income of other family members. Rather than making an *a priori* decision that one of these two possible definitions is the correct one and excluding the other one from consideration, it was decided to use whichever definition was the most statistically significant for the particular subgroup under consideration.

Some Useful Concepts

Finally, before we get mired in regressions, coefficients, and tables, it may be useful to introduce some concepts that can be employed to help sort out the meaning of the empirical results below. First, since work (here work being measured as hours worked per year) and unemployment are inverses of one another, we can follow Hall[3] and decompose unemployment into its two component parts--spells of unemployment and duration of unemployment. That is, the total time that a person spends unemployed in any given year equals the sum of the number of times he is unemployed (spells) multiplied by the duration of unemployment in each case. It follows that the amount of work which an individual performs would equal the time possible for work less the unemployment time. The notion of "spells of unemployment" brings to mind a different image of what it means to work less than what was suggested in the second and third chapters. In those chapters we had the individual adjusting his work effort so as to maximize utility--we made the implicit assumption that a full employment state existed and that the individual could work as little or as much as he wanted to. In reality, the amount of time that an individual spends unemployed is only partly controlled by himself, and the employer has a significant say as to how much work an individual performs. The notion of an individual adjusting his labor effort can be equated to the number of times the individual quits and how long he voluntarily prolongs his unemployment before returning to work. On the other hand, the worker can be involuntarily unemployed due to layoffs and the duration of these layoff periods can be prolonged by shortages of materials, weather, or, ultimately, the demand for the finished goods. Thus, we can visualize the unemployment time of a person as

---

[3] Robert E. Hall, "Turnover in the Labor Force," *Brookings Papers on Economic Activity*, No. 3 (1972), 709-756.

$$\begin{pmatrix}\text{Number of}\\ \text{Layoff}\\ \text{Periods}\end{pmatrix} \cdot \begin{pmatrix}\text{Average}\\ \text{Duration}\\ \text{of Layoffs}\end{pmatrix} + \begin{pmatrix}\text{Number}\\ \text{of Quit}\\ \text{Periods}\end{pmatrix} \cdot \begin{pmatrix}\text{Average}\\ \text{Duration}\\ \text{of Quits}\end{pmatrix} = \begin{matrix}\text{Unemployment}\\ \text{Time of}\\ \text{Individual}\end{matrix} .$$

The idea that workers increase their leisure and collect unemployment compensation benefits by becoming unemployed points up how drastic a decision it is for the worker to opt for more leisure. This dire choice between working for a wage or becoming unemployed and collecting unemployment compensation suggests two more reasons (besides the theoretical arguments of Chapter 3) why the unemployment compensation rate would be a good proxy for a negative income tax rate.

First, the breakeven point for most of the suggested negative income tax schemes would be about $4000 for a family of four. Thus, for a family of four to participate in the scheme their total earnings (plus unearned income if they had any) would have to be below $4000 annually. So long as the family had even one worker working a forty hour week all year at $2.00 per hour, they would not qualify for a negative income tax. This means that in all likelihood, for a family to qualify for the negative income tax, the family will have to have some periods when no one is working.

The second point follows from the first--disincentives from welfare payments have traditionally been measured by examining work effort responses to nonemployment income (here, this would be unearned income). However, there is an enormous difference between nonemployment income, as measured by dividends, interest, rental income, social security, etc., and income received from being unemployed and meeting some definition of being impoverished. Nonemployment income from, say, dividends is income that the individual receives whether or not he works and is not subject to the precondition of becoming totally unemployed, and such income implies that the individual has earning resources other than his labor effort which he can draw upon. Therefore, the unemployment compensation rate proxy should capture more of the desperate nature of being unemployed, poor, and qualified for a negative income tax.

An Empirical Example and Test

As a preliminary test of the model, and as a general example, we can first try out the model on the basic group of all prime aged, married, male workers (this includes both white and nonwhite workers and workers from both the South and non-South). As was stated above, the first step in the two stage least squares procedure is to obtain an estimate of the wage rate for the individual. This was accomplished by regressing the actual wage rate of the person on the exogenous variables--

$$\hat{w} = f(\text{demographic, labor market, industrial, and occupational variables}).$$

After some preliminary experimentation, a simple logarithmic form was used to calculate the wage rate. For the group of all prime aged, married, male workers, the estimated wage equation is given by--

$$[3] \quad \log \hat{w} = \underset{}{0.434} + \underset{(3.381)}{0.003 \cdot AGE} + \underset{(20.848)}{0.041 \cdot SCH} + \underset{(4.027)}{0.051 \cdot VET} + \underset{(3.142)}{0.137 \cdot HEAD} - \underset{(-11.753)}{0.188 \cdot SEC} \quad R^2 = 0.106 \quad F = 178.869,$$

where

AGE = age in years

SCH = years of schooling

VET = dummy for veteran status

HEAD = dummy for household head

SEC = dummy for secondary occupation defined in terms of color

( ) = t-ratios.

Equation [3] is a typical human capital wage equation where the wage rate is positively influenced by age, schooling, veteran status, and household head status, and negatively influenced by whether or not the individual is in a secondary type of occupation.[4] Using this equation we can take the anti-log of the calculated wage rates to find $\hat{w}$. Our basic reduced form regression equation for total hours worked for this group would be[5]

$$[4] \quad W = 2168.90 + \underset{(5.35)}{66.02 \cdot \hat{w}} - \underset{(-7.42)}{385.96 \cdot y} - \underset{(-4.35)}{0.05 \cdot T} \quad R^2 = 0.018 \quad F = 45.325,$$

---

[4] For example, see Alan S. Blinder, "Wage Discrimination: Reduced Form and Structural Estimates," Journal of Human Resources, Vol. 8 (Fall, 1973), 353-456.

[5] In the present example we will not include any of the demographic or other variables that might be significant in explaining the hours worked of this group.

where T is limited to the individual's own unearned income. From the end of Chapter 3 we see that all of the variables have the correct signs and the coefficients are statistically significant at the 1% level. The coefficient for y would be the total disincentive effect. In Chapter 3 we found that the transfer income effect was given by $wS\hat{\beta}_3$, where w = wage rate, S = unemployment time, and $\hat{\beta}_3$ = regression coefficient of T. We can use the group's mean $\hat{w}$ and calculate S by subtracting the group's mean weeks worked from 51[6] and multiplying by the group's average hours worked per week. For this group, mean $\hat{w}$ = 3.33, mean weeks worked per year = 49.876, and mean hours worked per week = 45.171. Therefore,

$$S = [(51.0)-(49.876)][45.171] = 50.772$$

and

$$wS\hat{\beta}_3 = (3.33)\cdot(50.772)\cdot(-0.05) = -8.63.$$

From Chapter 3 we have that we can subtract the transfer income effect from the total disincentive effect to obtain the substitution effect. For the present example, we have

$$\begin{aligned} \text{Substitution Effect} &= \text{(Total Effect)} - \text{(Transfer Income Effect)} \\ &= -385.96 - (-8.63) \\ &= -377.33. \end{aligned}$$

In a similar fashion, we can make use of the mean values of W and y and the coefficient of y from equation [4] to calculate the elasticity of W with respect to y. That is, the elasticity of W with respect to y is given by

$$\epsilon = \frac{\partial W}{\partial y}\,\frac{\bar{y}}{\bar{W}} .$$

---

[6] The CPS coding of weeks worked assigns a value of "51" to anyone who worked 50 to 52 weeks in 1966.

For this group,

$$\frac{\partial W}{\partial y} = -385.96$$

$$\bar{W} = 2256.355$$

$$\bar{y} = 0.315.$$

Or,

$$\varepsilon = \frac{(-385.96)\cdot(0.315)}{(2256.355)} = -0.05.$$

It should be noted here that while the size of the total disincentive effect usually has an absolute value of several hundred, the elasticity shows that total hours worked is very insensitive to changes in y. (The value of y ranged from 0.0 to 0.5, with a mean value of about 0.35 for most groups.) Also, note that the total transfer income effect contributes a very small, but significant, part to the total disincentive effect. If we were to measure the disincentive effect by how people respond to transfer income, we would have an elasticity of almost zero.

Reconsideration of Stratifying the Male Labor Force

It would appear from equations [3] and [4] that the model works very well--all of the coefficients have the predicted signs, all coefficients are individually statistically significant, the overall relationship is significant, the disincentive effect can easily be decomposed into the substitution and transfer income effects (each of which has the expected negative influence on total hours worked), and the elasticity indicates that workers do not behave in an outrageous manner with respect to the proxy variable. It would be tempting to stop here with this group which makes up approximately one-third of the total labor force and conclude that there would be disincentives associated with negative income taxation, but that the disincentives are of a very small magnitude. However, if we push the analysis one step further and ask if there might be differences between dissimilar types of workers, we will see that there is much more to be explained. We can follow Johnston[7] and introduce a dummy variable for manufacturing versus nonmanufacturing types of workers. That is, we can define a variable, D, where D has a value of "1" for manufacturing workers and "0" for nonmanufacturing workers. A simple test for determining whether there is a difference between the disincentives of these two groups is to add $D \cdot y$ to the regression equation. Similarly, we can add $D \cdot w$ and $D \cdot T$ to test for differences with respect to the wage rate and transfer income. Making these additions we now obtain

$$[5] \quad W = 2147.32 + \underset{(6.59)}{84.49 \cdot \hat{w}} - \underset{(-5.36)}{50.91 \cdot D\hat{w}} - \underset{(-7.73)}{450.13 \cdot y} + \underset{(3.78)}{339.26 \cdot Dy} - \underset{(-4.45)}{0.06 \cdot T}$$

$$+ \underset{(1.07)}{0.03 \cdot DT} \qquad R^2 = 0.022 \qquad F = 28.604.$$

The coefficient of Dy is statistically significant at the 1% level which indicates that there is a difference between the disincentive effects of manufacturing and nonmanufacturing workers. There also appears to be a significant difference between manufacturing and nonmanufacturing workers with respect to $\hat{w}$. Specifically, the slope coefficient of nonmanufacturing workers for y and $\hat{w}$ are given by -450.13 and 84.49, respectively, while those for manufacturing workers would be given by (-450.13 + 339.26) = -110.87 and (84.49 - 50.91) = 32.58. That is, there is much less of a disincentive for manufacturing workers with respect to y and a diminution of the upward sloping supply curve with respect to $\hat{w}$. This leads us to consider the many faceted stratification of the male labor force discussed earlier in this chapter.

---

[7] Johnston, Econometric Methods, 204-206.

Regression Results for the Male Labor Force

In the pages that follow, Tables 10.1 through 10.8 summarize the regression results for 46 different subgroups of the male labor force.[8] Because of the large number of subgroups, it would be impractical to discuss each group in detail as was done above. Instead, Tables 10.1 through 10.8 list the coefficients and t-ratios for the relevant variables (i.e., the estimated wage rate, unemployment compensation rate, and transfer income), sample size, F value, and level of significance. A cursory examination of these tables will reveal several general trends.

First, as we move away from the prime groups of workers and begin to consider the nonwhite or unmarried subgroups, it becomes increasingly more difficult to produce a meaningful labor supply equation. This is reflected in the fact that the F values become very low and the level of the F values for many of the subgroups is only significant at the 10, 25, or even 50 percent level. Care has to be exercised in interpreting the regression coefficients that come from a relationship which is only significantly different from no relationship at all at, say, the 25 percent level.

Secondly, the coefficients of the transfer income variable are almost always negative. In particular, the transfer income variable defined to be the individual's "own unearned income" was usually the more statistically

---

[8] The complete listing of the regression results for these 46 groups is to be found in the Appendix along with a discussion of several other points which are not of immediate importance here.

TABLE 10.1: SUMMARY OF REGRESSIONS FOR NORTHERN, WHITE, MARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (1713)	176.018 (5.410)	461.225 (3.893)	-0.129 (-2.855)		10.078 (1%)
	Manufacturing (723)	208.524 (4.323)	261.623 (1.581)	-0.198 (-3.014)		6.428 (1%)
	Nonmanufacturing (990)	78.080 (1.236	573.247 (3.475)		-0.010 (-1.546)	7.671 (1%)
30-50	All Workers (5434)	71.115 (4.227)	-406.187 (-6.233)	-0.049 (-3.597)		19.450 (1%)
	Manufacturing (2162)	29.830 (1.622)	2.956 (0.029)		-0.005 (-1.582)	6.437 (1%)
	Nonmanufacturing (3232)	140.409 (4.090)	-548.793 (-6.589)	-0.073 (-3.995)		17.231 (1%)
51-65	All Workers (2558)	213.402 (6.195)	-11.587 (-0.150)	-0.052 (-3.734)		10.093 (1%)
	Manufacturing (1025)	115.593 (3.777)	21.816 (0.179)	-0.037 (-1.596)		9.995 (1%)
	Nonmanufacturing (1533)	247.200 (4.666)	-41.184 (-0.416)	-0.057 (-3.169)		7.982 (1%)

[a] See Tables A.1.1A through A.1.3N in the Appendix for a complete listing of regression results.

TABLE 10.2: SUMMARY OF REGRESSIONS FOR NORTHERN, NONWHITE, MARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (222)	169.690 (1.630)	400.812 (1.681)	-0.296 (-2.241)		2.948 (2.5%)
	Manufacturing (105)	147.236 (1.897)	1033.796 (3.226)	-0.720 (-3.186)		6.824 (1%)
	Nonmanufacturing (117)	-34.653 (-0.209)	-217.833 (-0.725)	-0.157 (-0.948)		1.018 (50%)
30-50	All Workers (595)	36.585 (0.809)	17.728 (0.147)	-0.067 (-1.456)		2.061 (10%)
	Manufacturing (237)	30.657 (0.450)	386.847 (1.724)	-0.136 (-2.230)		4.012 (1%)
	Nonmanufacturing (358)	25.415 (0.576)	28.775 (0.192)		-0.007 (-0.638)	0.728 (b)
51-65	All Workers (186)	294.681 (4.108)	211.045 (1.608)	0.038 (0.814)		4.677 (1%)
	Manufacturing (67)	45.504 (0.681)	385.423 (2.315)	-0.006 (-0.086)		1.949 (25%)
	Nonmanufacturing (119)	170.402 (2.042)	234.436 (1.255)	0.053 (0.873)		3.414 (1%)

[a] See Tables A.2.1A through A.2.3N in the Appendix for a complete listing of regression results.

[b] Not significant at 50% level.

TABLE 10.3: SUMMARY OF REGRESSIONS FOR NORTHERN, WHITE, UNMARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (414)	59.441 (0.795)	593.454 (4.918)		-0.007 (-1.965)	12.030 (1%)
	Manufacturing (112)	184.887 (2.635)	740.944 (3.457)	-0.200 (-0.951)		4.348 (1%)
	Nonmanufacturing (302)	-92.688 (-1.039)	518.123 (3.097)		-0.011 (-2.110)	11.386 (1%)
30-50	All Workers (688)	144.476 (3.779)	549.269 (3.406)	-0.022 (-0.483)		6.531 (1%)
	Manufacturing (236)	149.968 (3.026)	1043.472 (3.695)	-0.024 (-0.442)		7.085 (1%)
	Nonmanufacturing (452)	121.787 (2.576)	455.245 (2.314)	-0.011 (-0.170)		2.969 (5%)
51-65	All Workers (309)	288.015 (3.472)	397.274 (2.138)	-0.081 (-1.934)		5.974 (1%)
	Manufacturing (106)	22.290 (0.188)	728.300 (1.971)	0.006 (0.131)		1.380 (25%)
	Nonmanufacturing (203)	416.401 (2.912)	350.179 (1.527)	-0.100 (-1.707)		4.472 (1%)

[a] See Tables A.3.1A through A.3.3N in the Appendix for a complete listing of regression results.

TABLE 10.4: SUMMARY OF REGRESSIONS FOR NON-SOUTH, NONWHITE, UNMARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (88)	45.519 (0.511)	80.817 (0.603)		-0.019 (-2.325)	2.709 (2.5%)
30-50	All Workers (128)	365.468 (2.007)	763.697 (2.896)	-0.033 (-0.461)		3.430 (2.5%)
51-65		LESS	THAN	50	WORKERS	

---

[a] See Tables A.4.1A and A.4.2A in the Appendix for a complete listing of regression results.

TABLE 10.5: SUMMARY OF REGRESSIONS FOR SOUTHERN, WHITE, MARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (466)	86.631 (0.617)	289.845 (0.789)		-0.034 (-2.260)	6.310 (1%)
	Manufacturing (154)	-70.346 (-0.711)	671.542 (1.130)	0.190 (1.098)		4.738 (1%)
	Nonmanufacturing (312)	5.359 (0.037)	224.387 (0.477)		-0.060 (-2.910)	5.260 (1%)
30-50	All Workers (1301)	21.584 (0.648)	-600.959 (-3.234)	-0.032 (-1.206)		5.542 (1%)
	Manufacturing (382)	59.433 (1.092)	511.465 (1.333)		-0.011 (-1.089)	3.004 (1%)
	Nonmanufacturing (919)	37.217 (0.373)	-865.360 (-4.061)	-0.042 (-1.420)		5.399 (1%)
51-65	All Workers (514)	13.013 (0.271)	-254.838 (-1.304)	-0.076 (-2.606)		2.708 (5%)
	Manufacturing (143)	75.729 (1.092)	917.423 (2.180)	-0.038 (-0.918)		3.298 (1%)
	Nonmanufacturing (371)	-24.060 (-0.428)	-477.218 (-2.171)	-0.089 (-2.336)		3.380 (1%)

[a] See Tables A.5.1A through A.5.3N in the Appendix for a complete listing of regression results.

TABLE 10.6: SUMMARY OF REGRESSIONS FOR SOUTHERN, NONWHITE, MARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (92)	115.120 (0.923)	1201.120 (2.807)	-0.109 (-0.141)		2.670 (10%)
30-50	All Workers (242)	-21.557 (-0.239)	-326.301 (-1.409)	0.178 (1.618)		1.562 (25%)
	Manufacturing (53)	98.235 (1.157)	870.584 (1.695)		-0.006 (-0.300)	3.752 (1%)
	Nonmanufacturing (189)	101.637 (0.834)	-294.798 (-1.223)		-0.017 (-1.102)	1.409 (25%)
51-65	All Workers (111)	220.229 (1.883)	170.512 (0.686)	-0.050 (-0.396)		1.427 (25%)

[a] See Tables A.6.1A through A.6.3A in the Appendix for a complete listing of regression results.

TABLE 10.7: SUMMARY OF REGRESSIONS FOR SOUTHERN, WHITE, UNMARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29	All Workers (137)	209.216 (1.682)	887.668 (3.031)	-0.321 (-1.516)		5.045 (1%)
30-50	All Workers (115)	156.950 (1.097)	445.511 (0.860)	-0.094 (-0.786)		1.378 (25%)
51-65		LESS	THAN	50	WORKERS	

[a] See Tables A.7.1A and A.7.2A in the Appendix for a complete listing of regression results.

TABLE 10.8: SUMMARY OF REGRESSIONS FOR SOUTHERN, NONWHITE, UNMARRIED, MALES[a]

Age	Type of Worker (sample size)	Regression Coefficients (t-ratios)				F Value (level)
		Estimated Wage Rate	Unemployment Compensation Rate	Transfer Income		
				Own Unearned Income	Other Family Income + Own Unearned Income	
21-29		LESS	THAN	50	WORKERS	
30-50	All Workers (70)	681.378 (1.813)	863.888 (2.399)	-0.161 (-0.718)		2.344 (10%)
51-65		LESS	THAN	50	WORKERS	

[a] See Table A.8.2A in the Appendix for a complete listing of regression results.

significant of the two possible definitions. For only about 25 percent of the subgroups did "other family income + own unearned income" prove to be the more statistically significant. And, again, the transfer income variable (and, hence, the transfer income effect) has a very small effect on total hours worked. Also, half of the subgroups where "other family income + own unearned income" was the more significant variable, are subgroups where the age of the worker is 21 to 29 years of age. The mean value of "other family income + own unearned income" for the 21 to 29 year old groups was usually in excess of $4000 due to either working spouses (for the groups that were married) or income received by parents (for the groups that were unmarried). For the other subgroups, the mean value of transfer income was on the order of several hundred dollars. If we were to measure labor effort disincentives in terms of how people respond to "unearned income," the conclusion would be almost unanimous that payments from a negative income tax will produce an extremely small decline in labor effort.

The third general conclusion to be gleaned from Tables 10.1 through 10.8, however, is not nearly as definite or as positive. We saw above that, for all married males between the ages of 30 and 50, the sign on the unemployment compensation rate was negative and statistically significant. However, for most of the 46 subgroups the sign of the unemployment compensation rate is positive. The only subgroups that show a strong disincentive effect are the prime aged, married, white males (Tables 10.1 and 10.5). Other white, married, male subgroups show a tendency for a negative sign on the unemployment compensation rate. While these subgroups are in a minority, the sizes of these groups (in terms of the number of workers) are the largest--white, married, males between the ages of 30 to 50 represent over one-third of the total male labor force. Also, note that even for the white, married, males between 30 and 50 years of age (Table 10.1), the disincentive effect is concentrated among the nonmanufacturing workers. For all 46 subgroups, none of the manufacturing subdivisions has a negative coefficient for the unemployment compensation rate and in almost every case the coefficient for manufacturing workers is a larger positive number than that for nonmanufacturing workers. The fact that there appears to be a systematic difference between manufacturing and nonmanufacturing workers confirms the conclusions reached from equation [5]. Since, from Chapter 2, we have that the sign of the proxy variable should be unambiguously negative,[9] we have to look outside of pure utility maximization theory for an explanation for these apparent irregularities.

Interpretation of Regression Results

We can begin by re-examining the unemployment compensation rate--

$$y = \frac{\text{(individual's potential weekly unemployment benefits)}}{\text{(individual's wage rate) (group's average weekly hours)}} .$$

For the vast majority of workers, the weekly unemployment benefits can be considered an exogenously determined variable. That is, most state formulas for calculating weekly benefits give the worker approximately 50 percent of his weekly wage, but impose a maximum dollar amount. The great number of workers will easily reach the maximum dollar amount so that the amount they receive in benefits is, essentially, a lump-sum amount determined by the state legislature. This means that the unemployment compensation rate will usually vary between two workers of the same state due to differences in their wage rates. For example, if the maximum was \$40.00, the group's average hours worked per week were 40 hours, and two individuals, A and B, had wage rates of \$2.00 and \$3.00, respectively, we would have

---

[9] At the end of Chapter 2, we arrived at a theoretical possibility that the sign could be positive if the cross partial term U_{LY} is negative. But this would mean, for example, that for only manufacturing workers to have a positive coefficient, or a larger positive coefficient, we would have to assume that manufacturing workers have a different utility function than nonmanufacturing workers.

$$y_A = \frac{40.00}{(2.00)\,(40)} \qquad y_B = \frac{40.00}{(3.00)\,(40)} .$$

$$= 0.50 \qquad = 0.33.$$

If our theory is correct, individual A should work less than individual B. That is, the individual with the lower wage rate (i.e., higher unemployment compensation rate) should work less than the higher wage rate worker. The counter-intuitive results we have to explain are why, except for white, married, prime aged workers, does it appear that the lower the wage rate (i.e., the higher the unemployment compensation rate), the more hours an individual works--the positive coefficient on y--and why manufacturing workers consistently show less of a disincentive than nonmanufacturing workers?

Following Thurow and his discussion of the queue theory of the labor market and the effect of aggregate demand on employment opportunities,[10] we can consider our low wage workers to be "disadvantaged" and the higher wage workers to be the "preferred workers." Thurow hypothesizes that:[11]

---

[10] Lester C. Thurow, Poverty and Discrimination (Washington, D.C.: Brookings Institute, 1969), 46-65.

[11] Ibid., 49.

> . . . (1) When demand expands, the marginal employment gains among the disadvantaged will be relatively larger than those of preferred workers. (2) As the level of capacity utilization rises, the marginal gains in employment among the disadvantaged will become larger and larger relative to employment gains among preferred workers. (3) If capacity utilization is above some threshold, the disadvantaged will make large relative employment gains, but if it is below the threshold, there will be no gains.

For our purposes, we can consider the queue theory to be most applicable to those groups of workers which contain a significant number of less desirable "disadvantaged" workers. That is, the white, married, prime aged group of workers would be comprised almost exclusively of preferred workers and the queue theory would not be particularly relevant. But, for a group of nonwhite or young workers, a goodly percentage of these groups would be considered disadvantaged.[12] Using the queue theory and recognizing the fact that 1966 represented the bottom of the trough in unemployment and the peak in real GNP growth for a considerable period, we can a priori predict that the disadvantaged workers would experience a substantial expansion in employment opportunities relative to preferred workers. Specifically, a short-term surge in real GNP, as was experienced in 1966, would not affect the high wage, skilled, preferred workers, but would cause a substantial increase in the use of low wage, unskilled labor. Therefore, for a group of nonwhite workers, we would expect those skilled workers at the top of the queue with high wages (i.e., low unemployment compensation rates) to be little affected by the tight labor market, whereas the unskilled workers at the bottom of the queue with low wages (i.e., high unemployment compensation rates) would experience increased employment opportunities.

---

[12] To be sure, nonwhites, as a group, are "disadvantaged" relative to whites. But, here we are interested in the work opportunities of preferred versus disadvantaged workers within a particular group and not between groups.

We can arrive at the same conclusion if we use Oi's concept of labor as a quasi-fixed factor of production.[13] Oi argues that labor, particularly skilled labor, can be considered a quasi-fixed factor in its relationship to capital. In the short-run, capital is fixed and, hence, so are the employment opportunities of skilled labor. This leads, again, to the conclusion that to increase output in the short-run, the firm would have to increase the use of its variable inputs (i.e., unskilled labor). And, as Thurow points out in a footnote,[14] if the shortage of labor existed for a long period of time, firms may actually find it profitable to substitute capital for skilled labor which could lead to an absolute decline in the employment opportunities of skilled workers.

In either case, an argument can be made that the unusually tight labor market of 1966 would have tended to increase considerably the employment opportunities of the low wage workers. Thus, groups that contained a significant number of low wage workers would exhibit the peculiar characteristic of appearing to work more as the unemployment compensation rate increased.

To see more clearly what is happening, we can examine the relationship between wage rates and work effort. Table 11 shows how total hours worked varies with wage rates for all married, prime aged, male workers (this is the group of workers discussed in detail above). Except for the high

---

[13] Walter Y. Oi, "Labor as a Quasi-Fixed Factor," Journal of Political Economy, Vol. 70 (December, 1962), 538-555. Oi investigates the reasons why a firm would keep high wage, skilled labor employed in a downturn, and we have extended the argument to consider the employment opportunities in an upturn.

[14] Thurow, Poverty and Discrimination, 47.

TABLE 11: HOURS AND WEEKS WORKED BY WAGE RATE FOR ALL, MARRIED, PRIME AGED, MALE WORKERS

Wage Rate	Weeks Worked Per Year	Average Hours Worked Per Week	Percent of Workers
$5.00 and above	48.67	41.28	18
$4.50 to $4.99	49.35	46.87	4
$4.00 to $4.49	50.54	43.03	15
$3.50 to $3.99	50.45	42.68	13
$3.00 to $3.49	50.40	44.56	17
$2.50 to $2.99	50.19	46.89	13
$2.00 to $2.49	49.96	49.10	9
Below $2.00	49.18	52.00	11

TABLE 12: HOURS AND WEEKS WORKED BY WAGE RATE FOR ALL NONWHITE MALE WORKERS

Wage Rate	Weeks Worked Per Year	Average Hours Worked Per Week	Percent of Workers
$5.00 and above	38.84	39.88	5
$4.50 to $4.99	42.00	43.39	1
$4.00 to $4.49	48.43	40.78	7
$3.50 to $3.99	48.88	40.80	8
$3.00 to $3.49	49.60	41.61	13
$2.50 to $2.99	49.89	41.83	15
$2.00 to $2.49	49.48	42.79	15
Below $2.00	48.87	44.42	36

wage workers ($4.50 and above) we see that weeks worked per year decline steadily as the wage rate declines--this confirms the fact that lower wage workers have higher unemployment rates. However, the lowest wage workers exhibit the peculiar characteristic of having high hours worked per week. The effect of higher hours worked per week greatly outweighs the reduced number of weeks worked per year and the net effect is that the lowest wage workers are working approximately 20 percent more than the group as a whole.

The fact that only 11 percent of all married, prime aged, male workers have a wage rate of below $2.00 means that the peculiarities of this group have little effect on the group as a whole. If, however, we look at the same breakdown for all nonwhite workers--Table 12--we see that, again, the lowest wage workers exhibit the tendency to work many more hours per week even though they work fewer weeks per year. The fact that, now, 36 percent of the nonwhite workers have a wage rate of below $2.00 means that the unusual behavior of the lowest wage workers will exert some considerable influence on the group as a whole. Specifically, we would expect to find that groups of workers having a large proportion of low paid workers exhibit a much weaker positive relationship between wages and work effort, and a reduced disincentive effect with respect to the unemployment compensation rate. That is, we would expect that the lowest wage workers (i.e., workers with the highest unemployment compensation rate) are working more hours per year than higher wage workers. And, this extraordinary behavior is due to the fact that, while they do suffer more unemployment in terms of weeks spent unemployed, when they do find work, they work many more hours per week than the average for the group. These results are due in large part to the tight labor market of 1966 and in another year, when the aggregate unemployment rate was higher, we would expect the dispersion of weeks worked between high and low wage workers to be much greater and the opportunities for low wage workers to work 45 or 50 hours a week to be much less.[15]

One of the surprises of the empirical work was that the SMSA unemployment rate seldom proved to be a significant variable in explaining the total hours worked by individuals (see the regression results in the Appendix). Specifically, the SMSA unemployment rate was never significant for nonwhite workers. Intuitively, we would expect that the higher the SMSA unemployment rate, the lower the hours worked by the individuals. However, from Tables 11 and 12 we see that the effect of unemployment (i.e., lower weeks worked per year) can be greatly mitigated by increased hours worked per week. Table 12 suggests that the nonwhite workers may have been particularly successful in overcoming the effect of unemployment, and this would explain why the SMSA unemployment rate did not have a significant effect on total hours worked.

So far, we have examined the results from the demand side of the labor market. As was discussed above, the worker can also increase his leisure by quitting his job. Again, a worker will not lightly consider such an option unless he has some reasonable expectation of finding another job. The fact that 1966 was such an unusually good year for employment prospects, would provide another reasonable argument to explain the results obtained. It is plausible to assume that any worker considering the option of quitting to look for another job, would have taken advantage of the 1966 labor market to make such a move. This would be particularly true of workers who, for one reason or another, felt that they had salable skills and who felt that their present wages were below what they should be. Thus, the high wage, skilled workers in such groups as the nonwhites or youth may have exercised the option to quit to try to find better (i.e., higher paying) jobs. This could help explain the unusually low weeks worked for the high wage workers in Table 12.

---

[15] These findings tend to support Thurow's conclusion that a tight labor market will increase the earnings of the disadvantaged workers relatively more than those of the preferred workers. The conclusions reached here would argue that, while the tight labor market does not equalize the weeks worked of disadvantaged and preferred workers, the increased hours worked per week of the disadvantaged workers provide the opportunity for increasing their income. More important, however, is the fact that the demand side of the labor market provides an opportunity to increase work effort by the lowest wage workers, increase their income, and produce a more egalitarian income distribution, all with an increase in total output.

All of the arguments above, used to explain the size of the coefficient of the unemployment compensation rate, can be employed to help understand the difference in the relative size of the unemployment compensation rate coefficient between manufacturing and nonmanufacturing groups. Since the 1966 expansion was prompted by the beginning of the Viet Nam build-up, the sector of the economy that underwent the greatest pressure was manufacturing (1966 real output from manufacturing industries increased by 8 percent over 1965). While the employment opportunities of low wage workers were expanding in general, the expansion was probably the greatest in the manufacturing industries where the fixity between capital and skilled labor is the greatest. Also, as new workers were hired by manufacturing firms from the bottom of the worker queue, they were being placed in a very institutionally rigid job ladder where their probability of maintaining work was directly related to the amount of work they did.

The Substitution Effect, Transfer Income Effect, and Elasticities

Following the same procedure in the above example, we can decompose the total disincentive effect (i.e., the uncompensated effect) into its component parts--the substitution and transfer income effects--and calculate the elasticity of work effort with respect to the proxy.[16] This gives us a better indication of the separate effects of changing the proxy variable and provides an estimate of how sensitive people are toward the proxy. This was done for those subgroups that have an F value significant at the 10 percent level (Tables 10.1 through 10.8) and when the relevant coefficients (i.e., the coefficients of the unemployment compensation rate and transfer income) were individually significant at the 10 percent level (e.g., the t-ratio was greater than 1.282). Tables 13.1 through 13.3 summarize these calculations for all workers, manufacturing workers, and nonmanufacturing workers.

The decomposition of the total disincentive effect confirms two facts which follow directly from the regression results above. First, the transfer income effect is always negative and small. Secondly, the negative substitution effect is concentrated among the prime groups of workers in the nonmanufacturing industries. Both of these facts have immediate implications.

As was pointed out at the end of Chapter 1 and elsewhere, many of the past studies have used some form of lump-sum unearned income as a proxy for the negative income tax. Our present results would suggest that such a method of obtaining estimates of the disincentive effect will almost certainly generate the expected negative sign on the proxy variable. If

---

[16] The information necessary to decompose the total disincentive effect (i.e., the wage rate, hours worked per week, and weeks worked per year for the group) can be found in the Appendix.

TABLE 13.1: SUMMARY OF DISINCENTIVES FOR ALL WORKERS

Region of Country	Marital Status	Race	Age	Total Effect	Transfer Income Effect	Substitution Effect	Elasticity	Sample Size
Non-South	Married	White	21-29	461.225	-34.462	495.687	0.08	1713
Non-South	Married	White	30-50	-406.187	-8.055	-398.132	-0.06	5434
Non-South	Married	Nonwhite	21-29	400.812	-60.887	461.699	0.09	222
Non-South	Unmarried	White	21-29	593.454	-1.253	594.707	0.14	414
Non-South	Unmarried	White	51-65	397.274	-20.808	418.082	0.07	309
South	Married	White	30-50	-600.959	-7.243	-593.716	-0.08	1301
South	Married	White	51-65	-254.838	-11.261	-243.577	-0.03	514
South	Unmarried	White	21-29	887.668	-94.229	982.336	0.17	137

TABLE 13.2: SUMMARY OF DISINCENTIVES FOR NONMANUFACTURING WORKERS

Region of Country	Marital Status	Race	Age	Total Effect	Transfer Income Effect	Substitution Effect	Elasticity	Sample Size
Non-South	Married	White	21-29	573.247	-2.802	576.049	0.09	990
Non-South	Married	White	30-50	-548.793	-14.690	-534.103	-0.07	3232
Non-South	Unmarried	White	21-29	518.123	-2.081	520.204	0.12	302
Non-South	Unmarried	White	51-65	350.179	-26.904	377.083	0.06	203
South	Married	White	30-50	-865.360	-7.042	-858.318	-0.11	919
South	Married	White	51-65	-477.218	-14.814	-462.404	-0.06	371

TABLE 13.3: SUMMARY OF DISINCENTIVES FOR MANUFACTURING WORKERS

Region of Country	Marital Status	Race	Age	Total Effect	Transfer Income Effect	Substitution Effect	Elasticity	Sample Size
Non-South	Married	White	21-29	261.623	-49.583	311.206	0.05	723
Non-South	Married	Nonwhite	21-29	1033.796	-184.428	1218.224	0.23	105
Non-South	Married	Nonwhite	30-50	386.847	-33.240	420.087	0.08	237

we were only to consider the transfer income effect, the unqualified conclusion would be: disincentive effects result from negative income taxation. However, the results of our study suggest that the negative transfer income effect is of only slight consequence when considered alongside of the substitution effect. It would appear that the transfer income variable is a totally unsatisfactory variable for measuring the magnitude of the total disincentive effect and cannot even be used to indicate the sign of the total disincentive effect.

The perverse nature of the substitution effect of certain groups gives us reason to question the assumption of utility maximization of these groups. That is, if the substitution effect measures how individuals respond to pure changes in the negative income tax rate, our results show that many groups behave in the exact opposite way as theory would predict. From the graphical discussion in Chapter 1 and theoretical discussions in Chapters 2 and 3, we demonstrated that the individual should equate his wage rate (net of the negative income tax or proxy variable) and the marginal rate of substitution between leisure and income. The diagrams and theory would suggest that if the negative income tax rate increases (i.e., the net wage rate decreases) the individual should work less. There are two possible explanations why this is not borne out in the empirical results.

First, we could hypothesize that the original assumption that income and leisure are normal goods was incorrect. That is, if leisure and/or income were inferior goods, we would expect that there would be positive incentive effects associated with negative income taxation. However, given that the positive substitution effect is concentrated among the low wage workers, the assumption that income and/or leisure are inferior goods is not very plausible.

The second possibility that might explain the positive substitution effect is that the individuals are prevented, for one reason or another, from ever reaching a position of equating their wage rate and marginal rate of substitution between leisure and income. At the end of Chapter 3, a diagrammatic exposition showed that individuals (particularly low income individuals) might be prevented from reaching an optimal position because they faced a truncated income-leisure opportunity locus (Figure 7). If this were true, the slope of the income-leisure opportunity locus (which is a function of the net wage rate) would be of secondary importance relative to the truncation. Hence, the main factor influencing the work effort of the individual would be whether or not the opportunity exists to work and not the net wage rate. This argument would tend to support the conclusion reached above that the low wage workers were taking advantage of the work opportunities of 1966 to work an unusually large number of hours.

Finally, the elasticities of work effort with respect to the proxy variable indicate that, as a whole, workers would not be particularly sensitive to changes in the negative income tax rate. The elasticities range from -0.11 for Southern, married, white, prime aged workers to +0.23 for non-Southern, married, nonwhite, young workers. Clearly, the results are mixed. Even if we were to discount positive elasticities as reflecting the actions of low wage workers to the demand side of the labor market, the negative elasticities (ranging from -0.03 to -0.11) indicate that increases in the negative tax rate would have only slight consequences on the work effort of the male labor force.

Chapter 6: CONCLUSION

We began this investigation in Chapter 1 with two main premises. The first premise was that, while poverty in the United States did steadily decline over the last twenty or thirty years, it will continue to exist unless some significant action is taken by the government. Thus, while the basic economic growth in the United States reduced the proportion of the population living in poverty during the fifties and early years of the sixties, and the "war on poverty" made further inroads to help reduce the poor population, the late sixties and early seventies still found a substantial number of poor Americans. The second point followed from the first: the *ad hoc* attempts to alleviate the pains of poverty before the "war on poverty" and the many well-intentioned social programs of the "war on poverty" to eliminate poverty have left the nation with a welfare system that is fractured into dozens of pieces and maintains only a semblance of cohesion through bureaucratic red tape. From these two points we concluded that what was needed was one federally sponsored program reaching all of the poor and getting at the immediate problem of poverty--low income. One of the most often mentioned possibilities for doing all of this is the negative income tax.

As early as 1942 it was recognized that a negative income tax scheme suffered from one major drawback--by paying individuals a subsidy based on how little they earned, the government might encourage individuals to reduce their work effort to collect the subsidy. We found in Chapter 2 that, indeed, there was a theoretically sound argument that the negative income tax would act to reduce the work effort of individuals. However, since no negative income tax data is extant, we had to look elsewhere in order to obtain an empirical measure of the possible disincentive effect of the negative income tax. In Chapter 3 we constructed a proxy variable for the negative income tax rate--the unemployment compensation rate. Finally, in the last chapter we saw that the actual work effort responses of male workers to the proxy variable were rather ambiguous.

The ambiguity of the empirical results of the last chapter stemmed from the fact that, while the white, prime aged, married workers behaved in the predicted fashion to the proxy variable, the nonwhites, youth, and unmarried workers behaved in an almost perverse manner. At first glance these results were somewhat alarming since it is these groups which make up a significant portion of the poor population. Upon further examination we found that, especially for nonwhites, the cause of these peculiar results was the fact that the lowest wage workers were working an extraordinary number of hours per week. We postulated that a likely explanation of this extraordinary behavior was the unusually tight labor market existing in 1966.

From Table 1, we see that 1966 was a particularly good year in terms of reducing the poor population. For example, for the nonwhite population the percent of nonwhites in poor families dropped from 46.8 to 38.9 percent in this one year (i.e., the number of poor in nonwhite families fell from 9.85 million to 8.38 million). The fact that 1966 was such a good year in terms of reducing the number of poor can be attributed in no small measure to the unusually large demand for workers. This would tend to support the hypothesis that the income of the poor (i.e., the lowest wage workers) is particularly sensitive to the demand side of the labor market. Specifically, the fact that 36 percent of the adult, male, nonwhite workers had a wage rate below $2.00 an hour means that, even if they worked 2000 hours per year, many of them would still be below the poverty line. The only opportunity for workers with a wage rate of below $2.00 an hour to make it over the poverty line would be to work an unusually large number of hours per week when they found work. The fact that 1966 provided an opportunity to work these unusually large number of hours and that the number of poor was reduced dramatically in 1966 leads one to believe that the poor did take advantage of the employment opportunities to work more and increase their incomes.

Clearly, the disincentives that would result from the introduction of a negative income tax plan will depend upon the exact parameters of the plan and the existing aggregate labor market conditions at the time. For example, if a tight labor market exists where the unemployment rate is low and the lowest wage workers are working extraordinary hours, and the guaranteed minimum income is relatively high, it would be reasonable to expect the lowest wage workers to opt for more leisure. The leisure may take the form of working only a standard 40 hour work week rather than 55 or more hours a week. On the other hand, if the labor market is slack, with high unemployment and many low wage workers working on a part-time basis, the propensity of individuals to reduce further their hours worked to collect additional benefits from the negative income tax would be minimal. Hence, when one considers the probable disincentive effects of the negative income tax, it is important to keep in mind the demand side of the labor market as well as the supply side.

If we make the assumption that the white, married, prime aged, male workers represent a group of workers which is little affected by the changing demand side of the labor market, we may use their work effort responses to represent how the workers in general would adjust their labor supply given the demand side of the labor market. The elasticity of hours worked per year with respect to the unemployment compensation rate would then range from -0.07 for non-Southern workers in nonmanufacturing industries to -0.11 for Southern workers in nonmanufacturing industries. That is, if the unemployment compensation rate--or, hopefully, the negative income tax rate--were to increase by 10 percent, total hours worked would drop by 0.7 to 1.1 percent for nonmanufacturing workers. It would also appear that manufacturing workers in this group of workers have no significant disincentive toward the proxy. This can be explained, at least in part, by the fact that the manufacturing industries are characterized by a very rigid job structure that prevents the individual workers from exercising choice in selecting the number of weeks worked or hours worked per week. Therefore, these elasticities should probably be considered as upper limits on the voluntary labor effort disincentives associated with the negative income tax rate.

Care has to be taken in interpreting the elasticities of other groups of workers. Clearly, when we talk about disincentives that might be experienced from negative income taxation, we are concerned about what the individual voluntarily does. That is, while it may be valid to criticize the negative income tax scheme on the grounds that people may opt to work less and collect payments from the government, it would be invalid to make the negative income tax scheme the sole influence on work

BEST COPY AVAILABLE

effort. The fact that the empirical results of the last chapter show it is possible to obtain elasticities on the order of +0.2 would indicate that there are many more factors influencing the work effort decisions of individuals--particularly individuals in groups that have large numbers of low wage workers.

The conclusions from this study are: disincentives appear to be associated with negative income taxation, and these disincentives depend upon whether the worker is in the manufacturing or nonmanufacturing industries. And, the disincentive effect for any group of workers is extremely sensitive to the employment opportunities of that group. That is, the groups of workers which should be least influenced by the aggregate employment opportunities show a small response to the proxy used, and the groups of workers which are subject to a wide variation of employment opportunities show no disincentive because their reactions to the tight labor market greatly outweigh any disincentives from the proxy. The policy implications would be that, while it is likely workers will exhibit disincentive tendencies under a negative income tax scheme, these tendencies will be greatly outweighed by conditions in the aggregate labor market.

APPENDIX

In this appendix a complete listing of the regression results is presented for the various subgroups. In all, there are 46 subdivisions of the eight basic subgroups, each subdivision having two regression equations. The first equation calculates the estimated wage rate, and the second, using the estimated wage rate, derives a labor supply equation. The subgroups, and their subdivisions, are ordered according to Table 9 in Chapter 5. That is, the non-Southern, married, white subgroup and its 9 subdivisions are first, followed by the non-Southern, married, nonwhite subgroup, etc. Within a subgroup, the workers are further stratified according to age (the youngest first) and type of industry (all workers first, followed by manufacturing and then nonmanufacturing workers). And, for both the wage equation and the labor supply equation, the various summary statistics [number of observations (N), R^2, F-value, and standard error of the estimate (S.E.E.)] are presented. In addition, following the summary statistics for the labor supply equation, the mean values of the estimated wage rate ($\hat{w}$), average hours worked per week, and weeks worked per year are given; these data can be used to calculate the transfer effect and substitution effect.[1]

---

[1] As was discussed in Chapter 5, the only time that the transfer income effect and substitution effect were calculated was when the individual coefficients were significant at the 10 percent level and when the F-value was also significant at the 10 percent level (see Tables 11.1 through 11.3 in Chapter 5).

In Chapter 5 we worked through an example for the basic group of all, married, prime aged workers in which we used a typical human capital equation to calculate the wage rate.[2] That is, schooling, age, veteran status, and household head status all contributed positively to the wage rate and an individual's being in a secondary occupation contributed negatively. From an examination of the various wage equations in this appendix, it is clear that these variables generally proved to be significant for the wages of most groups. In individual instances it might happen that particular variables did not prove significant in which case they would be dropped from the equation. Also, various interaction combinations of these variables were tried (e.g., age times schooling). However, due to extreme multicollinearity, it would seldom prove fruitful to include both the individual variables along with an interaction combination and so the interaction variables would usually be dropped.

In terms of the labor supply equations, we have already discussed the fact that, as we move away from the ideal subgroups of workers (e.g., prime aged, married, white males) and begin to consider groups of nonwhite or young workers, the labor supply model begins to break down and it is increasingly more difficult to obtain a meaningful labor supply equation. However, one interesting trend does seem to exist with regard to the secondary occupation variables. As a general rule, the secondary occupation variable defined in terms of race[3] tends to reduce the wage rate, while the secondary occupation variable defined in terms of sex[4] tends to be significant in reducing the hours worked by individuals. It would appear that various refinements of the secondary occupation variable could produce some interesting results in terms of earnings of workers (i.e., hours times wages).

---

[2] See equation [4] in Chapter 5.

[3] That is, the person is in an occupation that has a disproportionately large percentage of nonwhite workers (see Chapter 4).

---

[4] That is, the person is in an occupation that has a disproportionately large percentage of female workers (see Chapter 4).

TABLE A.1.1A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, MARRIED, WHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.372	
AGE IN YEARS	0.031	6.697
YEARS OF SCHOOLING	0.039	8.702
VETERAN DUMMY	0.076	3.428
HOUSEHOLD HEAD DUMMY	0.164	2.558
SECONDARY OCCUPATION DUMMY ON COLOR	-0.091	-2.943

N = 1713

R SQUARED = 0.105

F VALUE = 39.986

S.E.E. = 0.439

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1700.918	
SMSA UNEMPLOYMENT RATE	-43.039	-2.877
VETERAN DUMMY	-103.151	-3.688
ESTIMATED WAGE RATE	176.018	5.410
UNEMPLOYMENT COMPENSATION RATE	461.225	3.893
OWN UNEARNED INCOME	-0.129	-2.855

N = 1713

R SQUARED = 0.029

F VALUE = 10.078

S.E.E. = 533.767

MEAN $\hat{w}$ = 3.013

MEAN HOURS WORKED PER WEEK = 44.645

MEAN WEEKS WORKED PER YEAR = 49.014

TABLE A.1.1M: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE, 21 to 29 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-1.123	
AGE IN YEARS	0.038	5.358
YEARS OF SCHOOLING	0.055	8.411
HOUSEHOLD HEAD DUMMY	0.277	2.670
AVERAGE WEEKLY OVERTIME RATE IN THE INDUSTRY	0.073	3.767

N = 723
R SQUARED = 0.158
F VALUE = 33.751
S.E.E. = 0.430

TOTAL HOURS WORKED

INTERCEPT	1952.786	
YEARS OF SCHOOLING	-29.240	-2.708
SMSA UNEMPLOYMENT RATE	-43.616	-2.162
ESTIMATED WAGE RATE	208.524	4.323
UNEMPLOYMENT COMPENSATION RATE	261.623	1.581
OWN UNEARNED INCOME	-0.198	-3.014

N = 723
R SQUARED = 0.043
F VALUE = 6.428
S.E.E. = 445.360
MEAN $\hat{w}$ = 3.063
MEAN HOURS WORKED PER WEEK = 43.931
MEAN WEEKS WORKED PER YEAR = 49.139

TABLE A.1.1N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE, 21 to 29 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.123	
AGE IN YEARS	0.029	4.809
YEARS OF SCHOOLING	0.027	4.494
VETERAN DUMMY	0.077	2.617
HOUSEHOLD HEAD DUMMY	0.107	1.315
SECONDARY OCCUPATION DUMMY ON COLOR	-0.147	-3.739

N = 990

R SQUARED = 0.089

F VALUE = 19.263

S.E.E. = 0.441

TOTAL HOURS WORKED		
INTERCEPT	1114.619	
AGE IN YEARS	33.765	3.368
SMSA UNEMPLOYMENT RATE	-39.319	-1.859
VETERAN DUMMY	-135.000	-3.328
ESTIMATED WAGE RATE	78.080	1.236
UNEMPLOYMENT COMPENSATION RATE	573.247	3.475
OTHER FAMILY + OWN UNEARNED INCOME	-0.010	-1.546

N = 990

R SQUARED = 0.045

F VALUE = 7.671

S.E.E. = 584.135

MEAN $\hat{w}$ = 2.985

MEAN HOURS WORKED PER WEEK = 45.167

MEAN WEEKS WORKED PER YEAR = 48.922

TABLE A.1.2A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, MARRIED, WHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.590	
AGE IN YEARS	0.003	2.750
YEARS OF SCHOOLING	0.037	15.702
VETERAN DUMMY	0.035	2.411
HOUSEHOLD HEAD DUMMY	0.095	1.941
SECONDARY OCCUPATION DUMMY ON COLOR	-0.146	-7.766

N = 5434

R SQUARED = 0.076

F VALUE = 89.485

S.E.E. = 0.463

TOTAL HOURS WORKED		
INTERCEPT	2311.849	
AGE IN YEARS	-5.563	-4.638
SMSA UNEMPLOYMENT RATE	-18.650	-2.184
HOUSEHOLD HEAD DUMMY	135.477	2.413
SECONDARY OCCUPATION DUMMY ON SEX	-31.141	-1.640
ESTIMATED WAGE RATE	71.115	4.227
UNEMPLOYMENT COMPENSATION RATE	-406.187	-6.233
OWN UNEARNED INCOME	-0.049	-3.597

N = 5434

R SQUARED = 0.024

F VALUE = 19.450

S.E.E. = 523.382

MEAN $\tilde{W}$ = 3.518

MEAN HOURS WORKED PER WEEK = 45.149

MEAN WEEKS WORKED PER YEAR = 49.965

TABLE A.1.2M: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE, 30 to 50 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.449	
AGE IN YEARS	0.006	4.251
YEARS OF SCHOOLING	0.048	15.858
SECONDARY OCCUPATION DUMMY ON COLOR	-0.085	-3.088
	0.021	3.724

N = 2162
R SQUARED = 0.123
F VALUE = 75.858
S.E.E. = 0.383

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	2338.559	
AGE IN YEARS	-4.793	-3.181
HOUSEHOLD HEAD DUMMY	127.325	1.813
SECONDARY OCCUPATION DUMMY ON SEX	-63.160	-2.448
PERCENT UNIONIZATION IN INDUSTRY	-2.817	-3.813
ESTIMATED WAGE RATE	29.830	1.622
UNEMPLOYMENT COMPENSATION RATE	2.956	0.029
OTHER FAMILY + OWN UNEARNED INCOME	-0.005	-1.582

N = 2162
R SQUARED = 0.020
F VALUE = 6.437
S.E.E. = 402.885
MEAN $\hat{w}$ = 3.681
MEAN HOURS WORKED PER WEEK = 44.094
MEAN WEEKS WORKED PER YEAR = 50.325

TABLE A.1.2N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE, 30 to 50 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.837	
VETERAN DUMMY	0.043	2.059
YEARS OF SCHOOLING	0.031	9.452
SECONDARY OCCUPATION DUMMY ON COLOR	-0.187	-7.216
N = 3232		
R SQUARED = 0.065		
F VALUE = 74.971		
S.E.E. = 0.506		
TOTAL HOURS WORKED		
INTERCEPT	1977.802	
AGE IN YEARS	-4.311	-2.453
HOUSEHOLD HEAD DUMMY	172.177	2.129
SECONDARY OCCUPATION DUMMY COLOR	106.288	2.633
ESTIMATED WAGE RATE	140.409	4.090
UNEMPLOYMENT COMPENSATION RATE	-548.793	-6.589
OWN UNEARNED INCOME	-0.073	-3.995
N = 3232		
R SQUARED = 0.031		
F VALUE = 17.231		
S.E.E. = 585.959		
MEAN ω = 3.425		
MEAN HOURS WORKED PER WEEK = 45.831		
MEAN WEEKS WORKED PER YEAR = 49.718		

TABLE A.1.3A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, MARRIED, WHITE, 51 to 65 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	1.593	
AGE IN YEARS	-0.011	-3.838
YEARS OF SCHOOLING	0.026	6.975
CHANGE IN SMSA UNEMPLOYMENT RATE	0.087	3.047
SECONDARY OCCUPATION DUMMY ON COLOR	-0.191	-6.067

N = 2558

R SQUARED = 0.053

F VALUE = 35.393

S.E.E. = 0.565

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1240.339	
SMSA UNEMPLOYMENT RATE	-28.262	-2.154
CHANGE IN SMSA UNEMPLOYMENT RATE	-106.837	-3.649
HOUSEHOLD HEAD DUMMY	255.789	2.841
SECONDARY OCCUPATION DUMMY ON COLOR	107.267	2.838
ESTIMATED WAGE RATE	213.402	6.195
UNEMPLOYMENT COMPENSATION RATE	-11.587	-0.150
OWN UNEARNED INCOME	-0.052	-3.734

N = 2558

R SQUARED = 0.027

F VALUE = 10.093

S.E.E. = 521.123

MEAN $\hat{w}$ = 3.245

MEAN HOURS WORKED PER WEEK = 43.398

MEAN WEEKS WORKED PER YEAR = 49.330

TABLE A.1.3M: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE, 51 to 65 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	1.468	
YEARS OF SCHOOLING	0.037	8.622
SMSA UNEMPLOYMENT RATE	-0.050	-3.093
HOUSEHOLD HEAD DUMMY	-0.359	-2.885
SECONDARY OCCUPATION DUMMY ON SEX	-0.083	-2.391
PERCENT FEMALE IN INDUSTRY	-0.003	-3.172

N = 1025
R SQUARED = 0.105
F VALUE = 23.855
S.E.E. = 0.410

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	899.533	
HOUSEHOLD HEAD DUMMY	719.712	5.631
AVERAGE WEEKLY OVERTIME IN THE INDUSTRY	28.616	1.807
ESTIMATED WAGE RATE	115.593	3.777
UNEMPLOYMENT COMPENSATION RATE	21.816	0.179
OWN UNEARNED INCOME	-0.037	-1.596

N = 1025
R SQUARED = 0.047
F VALUE = 9.995
S.E.E. = 396.023
MEAN $\hat{w}$ = 3.489
MEAN HOURS WORKED PER WEEK = 42.765
MEAN WEEKS WORKED PER YEAR = 49.833

TABLE A.1.3N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, WHITE, 51 to 65 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	1.609	
AGE IN YEARS	-0.012	-3.038
YEARS OF SCHOOLING	0.023	4.371
SECONDARY OCCUPATION DUMMY ON COLOR	-0.223	-5.033

N = 1533

R SQUARED = 0.048

F VALUE = 25.461

S.E.E. = 0.642

TOTAL HOURS WORKED		
INTERCEPT	1512.041	
SMSA UNEMPLOYMENT RATE	-30.013	-1.709
SECONDARY OCCUPATION DUMMY ON COLOR	125.052	2.165
ESTIMATED WAGE RATE	247.200	4.666
UNEMPLOYMENT COMPENSATION RATE	-41.184	-0.416
OWN UNEARNED INCOME	-0.057	-3.169

N = 1533

R SQUARED = 0.025

F VALUE = 7.982

S.E.E. = 589.065

MEAN $\hat{W}$ = 3.100

MEAN HOURS WORKED PER WEEK = 43.822

MEAN WEEKS WORKED PER YEAR = 48.993

TABLE A.2.1A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, MARRIED, NONWHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-2.320	
AGE SQUARED	0.004	3.339
AGE*SCHOOL	0.018	2.926
AGE SQUARED*SCHOOL	-0.001	-2.839

N = 222

R SQUARED = 0.089

F VALUE = 7.060

S.E.E. = 0.484

TOTAL HOURS WORKED		
INTERCEPT	1607.980	
VETERAN*SCHOOL	-12.037	-1.987
ESTIMATED WAGE RATE	169.690	1.630
UNEMPLOYMENT COMPENSATION RATE	400.812	1.681
OWN UNEARNED INCOME	-0.296	-2.241

N = 222

R SQUARED = 0.052

F VALUE = 2.948 (significant at 2.5% level)

S.E.E. = 472.899

MEAN $\hat{w}$ = 2.372

MEAN HOURS WORKED PER WEEK = 43.360

MEAN WEEKS WORKED PER YEAR = 49.000

TABLE A.2.1M: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE 21 to 29 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	114.397	
AGE IN YEARS	-9.195	-2.338
YEARS OF SCHOOLING	-10.993	-2.480
AGE SQUARED	0.183	2.386
AGE*SCHOOL	0.881	2.523
AGE SQUARED*SCHOOL	-0.017	-2.561
PERCENT UNIONIZATION IN INDUSTRY	0.009	2.428
N = 105		
R SQUARED = 0.208		
F VALUE = 4.279		
S.E.E. = 0.455		
TOTAL HOURS WORKED		
INTERCEPT	1275.550	
ESTIMATED WAGE RATE	147.236	1.897
UNEMPLOYMENT COMPENSATION RATE	1033.796	3.226
OWN UNEARNED INCOME	-0.720	-3.186
N = 105		
R SQUARED = 0.169		
F VALUE = 6.824		
S.E.E. = 435.083		
MEAN $\hat{W}$ = 2.503		
MEAN HOURS WORKED PER WEEK = 42.819		
MEAN WEEKS WORKED PER YEAR = 48.610		

TABLE A.2.1N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE, 21 to 29 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.253	
AGE IN YEARS	0.038	1.984
VETERAN DUMMY	0.137	1.262

N = 117

R SQUARED = 0.064

F VALUE = 3.921 (significant at 2.5% level)

S.E.E. = 0.497

TOTAL HOURS WORKED		
INTERCEPT	2419.308	
SECONDARY OCCUPATION DUMMY ON COLOR	-167.244	-1.716
ESTIMATED WAGE RATE	-34.653	-0.209
UNEMPLOYMENT COMPENSATION RATE	-217.833	-0.725
OWN UNEARNED INCOME	-0.157	-0.948

N = 117

R SOUARED = 0.035

F VALUE = 1.018 (significant at 50% level)

S.E.E. = 489.508

MEAN $\hat{w}$ = 2.224

MEAN HOURS WORKED PER WEEK = 43.846

MEAN WEEKS WORKED PER YEAR = 49.350

TABLE A.2.2A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, MARRIED, NONWHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.081	
YEARS OF SCHOOLING	0.037	5.518
VETERAN DUMMY	0.093	2.127
HOUSEHOLD HEAD DUMMY	0.530	3.357
SECONDARY OCCUPATION DUMMY ON COLOR	-0.212	-4.496

N = 595

R SQUARED = 0.136

F VALUE = 23.212

S.E.E. = 0.517

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1758.777	
VETERAN DUMMY	53.165	1.191
HOUSEHOLD HEAD DUMMY	250.014	1.615
ESTIMATED WAGE RATE	36.585	0.809
UNEMPLOYMENT COMPENSATION RATE	17.728	0.147
OWN UNEARNED INCOME	-0.067	-1.456

N = 595

R SQUARED = 0.017

F VALUE = 2.061 (significant at 10% level)

S.E.E. = 485.538

MEAN $\hat{w}$ = 2.712

MEAN HOURS WORKED PER WEEK = 43.271

MEAN WEEKS WORKED PER YEAR = 49.128

TABLE A.2.2M: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE, 30 to 50 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.413	
CHANGE IN SMSA UNEMPLOYMENT RATE	0.109	1.357
HOUSEHOLD HEAD DUMMY	0.621	3.408
10 FIRM CONCENTRATION	0.004	2.912

N = 237

R SQUARED = 0.106

F VALUE = 9.176

S.E.E. = 0.437

TOTAL HOURS WORKED		
INTERCEPT	1762.742	
VETERAN DUMMY	151.761	2.758
ESTIMATED WAGE RATE	30.657	0.450
UNEMPLOYMENT COMPENSATION RATE	386.847	1.724
OWN UNEARNED INCOME	-0.136	-2.230

N = 237

R SQUARED = 0.065

F VALUE = 4.012

S.E.E. = 410.443

MEAN $\hat{W}$ = 2.999

MEAN HOURS WORKED PER WEEK = 42.270

MEAN WEEKS WORKED PER YEAR = 49.072

TABLE A.2.2N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE, 30 to 50 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.260	
YEARS OF SCHOOLING	0.056	6.437
VETERAN DUMMY	0.183	3.100
SECONDARY OCCUPATION DUMMY ON COLOR	-0.183	-2.872

N = 358

R SQUARED = 0.215

F VALUE = 32.289

S.E.E. = 0.533

TOTAL HOURS WORKED		
INTERCEPT	2005.588	
SMSA UNEMPLOYMENT RATE	-48.853	-1.285
HOUSEHOLD HEAD DUMMY	275.128	1.128
ESTIMATED WAGE RATE	25.415	0.576
UNEMPLOYMENT COMPENSATION RATE	28.775	0.192
OTHER FAMILY + OWN UNEARNED INCOME	-0.007	-0.638

N = 358

R SQUARED = 0.010

F VALUE = 0.728 (not significant at 50% level)

S.E.E. = 526.082

MEAN $\hat{w}$ = 2.563

MEAN HOURS WORKED PER WEEK = 43.933

MEAN WEEKS WORKED PER YEAR = 49.165

TABLE A.2.3A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, MARRIED, NONWHITE, 51 to 65 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.662	
YEARS OF SCHOOLING	0.029	2.234
SECONDARY OCCUPATION DUMMY ON COLOR	-0.183	-1.787

N = 186

R SQUARED = 0.056

F VALUE = 5.385

S.E.E. = 0.658

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1279.694	
VETERAN DUMMY	-110.803	-1.910
ESTIMATED WAGE RATE	294.681	4.108
UNEMPLOYMENT COMPENSATION RATE	211.045	1.608
OWN UNEARNED INCOME	0.038	0.814

N = 186

R SQUARED = 0.094

F VALUE = 4.677

S.E.E. = 342.941

MEAN $\hat{W}$ = 2.381

MEAN HOURS WORKED PER WEEK = 41.161

MEAN WEEKS WORKED PER YEAR = 49.925

TABLE A.2.3M: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE, 51 to 65 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.689	
CORPORATE ASSETS PER WORKER IN INDUSTRY	0.018	2.015

N = 67

R SQUARED = 0.059

F VALUE = 4.060

S.E.E. = 0.620

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	170.678	
VETERAN*SCHOOL	8.986	1.588
ESTIMATED WAGE RATE	45.504	0.681
UNEMPLOYMENT COMPENSATION RATE	385.423	2.315
OWN UNEARNED INCOME	-0.006	-0.086

N = 67

R SQUARED = 0.112

F VALUE = 1.949 (significant at 25% level)

S.E.E. = 220.048

MEAN $\hat{w}$ = 2.660

MEAN HOURS WORKED PER WEEK = 40.358

MEAN WEEKS WORKED PER YEAR = 50.343

TABLE A.2.3N: REGRESSION RESULTS FOR MALE, NON-SOUTH, MARRIED, NONWHITE, 51 to 65 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.384	
YEARS OF SCHOOLING	0.052	3.207
SECONDARY OCCUPATION DUMMY ON COLOR	-0.185	-1.450
N = 119		
R SQUARED = 0.127		
F VALUE = 8.469		
S.E.E. = 0.649		
TOTAL HOURS WORKED		
INTERCEPT	1675.287	
VETERAN DUMMY	-180.229	-2.227
SECONDARY OCCUPATION DUMMY ON COLOR	-133.416	-1.440
ESTIMATED WAGE RATE	170.402	2.042
UNEMPLOYMENT COMPENSATION RATE	234.436	1.255
OWN UNEARNED INCOME	0.053	0.873
N = 119		
R SQUARED = 0.131		
F VALUE = 3.414		
S.E.E. = 392.445		
MEAN $\hat{w}$ = 2.275		
MEAN HOURS WORKED PER WEEK = 41.613		
MEAN WEEKS WORKED PER YEAR = 49.689		

TABLE A.3.1A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, UNMARRIED, WHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-1.013	
AGE IN YEARS	0.051	3.864
YEARS OF SCHOOLING	0.035	2.986
VETERAN DUMMY	0.216	3.362
N = 414		
R SQUARED = 0.093		
F VALUE = 16.024		
S.E.E. = 0.652		
TOTAL HOURS WORKED		
INTERCEPT	667.529	
AGE IN YEARS	42.461	2.927
ESTIMATED WAGE RATE	59.441	0.795
UNEMPLOYMENT COMPENSATION RATE	593.454	4.918
OTHER FAMILY + OWN UNEARNED INCOME	-0.007	-1.965
N = 414		
R SQUARED = 0.093		
F VALUE = 12.030		
S.E.E. = 480.134		
MEAN $\hat{w}$ = 2.211		
MEAN HOURS WORKED PER WEEK = 42.341		
MEAN WEEKS WORKED PER YEAR = 49.088		

TABLE A.3.1M: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE, 21 to 29 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-1.688	
AGE IN YEARS	0.042	1.607
YEARS OF SCHOOLING	0.082	2.941
PERCENT UNIONIZATION IN THE INDUSTRY	0.009	1.758
N = 112		
R SQUARED = 0.143		
F VALUE = 6.023		
S.E.E. = 0.612		
TOTAL HOURS WORKED		
INTERCEPT	1594.153	
SMSA UNEMPLOYMENT RATE	-124.316	-2.321
CHANGE IN SMSA UNEMPLOYMENT RATE	-257.949	-2.242
ESTIMATED WAGE RATE	184.877	2.635
UNEMPLOYMENT COMPENSATION RATE	740.944	3.457
OWN UNEARNED INCOME	-0.200	-0.951
N = 112		
R SQUARED = 0.170		
F VALUE = 4.348		
S.E.E. = 376.094		
MEAN $\hat{W}$ = 2.290		
MEAN HOURS WORKED PER WEEK = 42.179		
MEAN WEEKS WORKED PER YEAR = 49.286		

TABLE A.3.1N: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE, 21 to 29 YEAR OLD, NONMANUFACUTRING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-1.793	
AGE SQUARED	0.004	2.334
AGE*SCHOOL	0.011	1.866
AGE SQUARED*SCHOOL	-0.0004	-1.799
VETERAN*SCHOOL	0.024	3.922

N = 302

R SQUARED = 0.117

F VALUE = 9.835

S.E.E. = 0.663

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	-19.829	
AGE IN YEARS	86.795	4.606
ESTIMATED WAGE RATE	-92.688	-1.039
UNEMPLOYMENT COMPENSATION RATE	518.123	3.097
OTHER FAMILY + OWN UNEARNED INCOME	-0.011	-2.110

N = 302

R SQUARED = 0.133

F VALUE = 11.386

S.E.E. = 557.112

MEAN $\hat{W}$ = 2.152

MEAN HOURS WORKED PER WEEK = 42.970

MEAN WEEKS WORKED PER YEAR = 48.954

TABLE A.3.2A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, UNMARRIED, WHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.558	
YEARS OF SCHOOLING	0.045	5.863
HOUSEHOLD HEAD DUMMY	0.108	2.294
SECONDARY OCCUPATION DUMMY ON COLOR	-0.247	-4.055

N = 688

R SQUARED = 0.109

F VALUE = 27.886

S.E.E. = 0.609

TOTAL HOURS WORKED		
INTERCEPT	1435.497	
ESTIMATED WAGE RATE	144.476	3.779
UNEMPLOYMENT COMPENSATION RATE	549.269	3.406
OWN UNEARNED INCOME	-0.022	-0.483

N = 688

R SQUARED = 0.028

F VALUE = 6.531

S.E.E. = 577.851

MEAN $\hat{W}$ = 3.088

MEAN HOURS WORKED PER WEEK = 42.549

MEAN WEEKS WORKED PER YEAR = 48.469

TABLE A.3.2M: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE, 30 to 50 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.717	
YEARS OF SCHOOLING	0.038	3.846
SECONDARY OCCUPATION DUMMY ON COLOR	-0.284	-3.171
PERCENT FEMALE IN THE INDUSTRY	-0.004	-1.792
10 FIRM CONCENTRATION	0.005	3.280

N = 236

R SQUARED = 0.176

F VALUE = 12.321

S.E.E. = 0.458

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1088.800	
HOUSEHOLD HEAD DUMMY	157.572	2.681
ESTIMATED WAGE RATE	149.968	3.026
UNEMPLOYMENT COMPENSATION RATE	1043.472	3.695
OWN UNEARNED INCOME	-0.024	-0.442

N = 236

R SQUARED = 0.109

F VALUE = 7.085

S.E.E. = 440.363

MEAN $\hat{w}$ = 3.326

MEAN HOURS WORKED PER WEEK = 41.691

MEAN WEEKS WORKED PER YEAR = 48.767

TABLE A.3.2N: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE, 30 to 50 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.402	
YEARS OF SCHOOLING	0.053	4.990
HOUSEHOLD HEAD DUMMY	0.114	1.806
SECONDARY OCCUPATION DUMMY	-0.234	-2.928

N = 452

R SQUARED = 0.115

F VALUE = 19.461

S.E.E. = 0.664

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1567.189	
ESTIMATED WAGE RATE	121.787	2.576
UNEMPLOYMENT COMPENSATION RATE	455.245	2.314
OWN UNEARNED INCOME	-0.011	-0.170

N = 452

R SQUARED = 0.019

F VALUE = 2.969 (significant at 5%)

S.E.E. = 635.038

MEAN $\hat{W}$ = 2.986

MEAN HOURS WORKED PER WEEK = 42.998

MEAN WEEKS WORKED PER YEAR = 48.314

TABLE A.3.3A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, UNMARRIED, WHITE, 51 to 65 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.727	
YEARS OF SCHOOLING	0.027	2.338
SECONDARY OCCUPATION DUMMY ON COLOR	-0.265	-2.774
N = 309		
R SQUARED = 0.058		
F VALUE = 9.367		
S.E.E. = 0.678		
TOTAL HOURS WORKED		
INTERCEPT	1251.019	
SECONDARY OCCUPATION DUMMY ON SEX	-141.222	-1.940
ESTIMATED WAGE RATE	288.015	3.472
UNEMPLOYMENT COMPENSATION RATE	397.274	2.138
OWN UNEARNED INCOME	-0.081	-1.934
N = 309		
R SQUARED = 0.073		
F VALUE = 5.974		
S.E.E. = 568.321		
MEAN $\hat{W}$ = 2.608		
MEAN HOURS WORKED PER WEEK = 42.511		
MEAN WEEKS WORKED PER YEAR = 48.683		

TABLE A.3.3M: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE, 51 to 65 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.828	
YEARS OF SCHOOLING	0.031	2.287
VETERAN DUMMY	0.094	1.095

N = 106

R SQUARED = 0.066

F VALUE = 3.609 (significant at 5% level)

S.E.E. = 0.412

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1795.059	
SECONDARY OCCUPATION DUMMY ON COLOR	-176.423	-1.546
ESTIMATED WAGE RATE	22.290	0.188
UNEMPLOYMENT COMPENSATION RATE	728.300	1.971
OWN UNEARNED INCOME	0.006	0.131

N = 106

R SQUARED = 0.052

F VALUE = 1.380 (significant at 25% level)

S.E.E. = 373.917

MEAN $\hat{W}$ = 3.249

MEAN HOURS WORKED PER WEEK = 42.330

MEAN WEEKS WORKED PER YEAR = 49.264

TABLE A.3.3N: REGRESSION RESULTS FOR MALE, NON-SOUTH, UNMARRIED, WHITE, 51 to 65 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.608	
YEARS OF SCHOOLING	0.029	1.915
SECONDARY OCCUPATION DUMMY ON COLOR	-0.280	-2.258

N = 203

R SQUARED = 0.060

F VALUE = 6.357

S.E.E. = 0.758

TOTAL HOURS WORKED		
INTERCEPT	2033.493	
AGE IN YEARS	-17.178	-1.533
SECONDARY OCCUPATION DUMMY ON SEX	-208.443	-2.125
ESTIMATED WAGE RATE	416.401	2.912
UNEMPLOYMENT COMPENSATION RATE	350.179	1.527
OWN UNEARNED INCOME	-0.100	-1.707

N = 203

R SQUARED = 0.102

F VALUE = 4.472

S.E.E. = 644.074

MEAN $\hat{W}$ = 2.409

MEAN HOURS WORKED PER WEEK = 42.610

MEAN WEEKS WORKED PER YEAR = 48.379

TABLE A.4.1A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, UNMARRIED, NONWHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-2.166	
AGE IN YEARS	0.062	1.529
YEARS OF SCHOOLING	0.063	1.899
VETERAN DUMMY	0.280	1.412
HOUSEHOLD HEAD DUMMY	0.343	1.808
N = 88		
R SQUARED = 0.170		
F VALUE = 4.241		
S.E.E. = 0.852		
TOTAL HOURS WORKED		
INTERCEPT	1635.910	
YEARS OF SCHOOLING	22.980	1.190
SECONDARY OCCUPATION DUMMY ON SEX	176.264	2.028
ESTIMATED WAGE RATE	45.519	0.511
UNEMPLOYMENT COMPENSATION RATE	80.817	0.603
OTHER FAMILY + OWN UNEARNED INCOME	-0.019	-2.325
N = 88		
R SQUARED = 0.142		
F VALUE = 2.709 (significant at 2.5% level)		
S.E.E. = 398.960		
MEAN $\hat{W}$ = 1.592		
MEAN HOURS WORKED PER WEEK = 41.580		
MEAN WEEKS WORKED PER YEAR = 48.580		

TABLE A.4.2A: REGRESSION RESULTS FOR ALL MALE, NON-SOUTH, UNMARRIED, NONWHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.753	
HOUSEHOLD HEAD DUMMY	0.158	1.374
SECONDARY OCCUPATION DUMMY ON COLOR	-0.201	-1.765

N = 128

R SQUARED = 0.037

F VALUE = 2.432 (significant at 10% level)

S.E.E. = 0.638

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	900.941	
ESTIMATED WAGE RATE	365.468	2.007
UNEMPLOYMENT COMPENSATION RATE	763.697	2.896
OWN UNEARNED INCOME	-0.033	-0.461

N = 128

R SQUARED = 0.077

F VALUE = 3.430 (significant at 2.5% level)

S.E.E. = 529.882

MEAN Q = 2.158

MEAN HOURS WORKED PER WEEK = 42.398

MEAN WEEKS WORKED PER YEAR = 48.156

TABLE A.5.1A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, MARRIED, WHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.460	
AGE IN YEARS	0.032	3.040
YEARS OF SCHOOLING	0.040	4.194
SMSA UNEMPLOYMENT RATE	-0.071	-1.840
CHANGE IN SMSA UNEMPLOYMENT RATE	0.103	1.693
VETERAN DUMMY	0.066	1.310
HOUSEHOLD HEAD DUMMY	0.347	2.434
SECONDARY OCCUPATION DUMMY ON COLOR	-0.186	-2.153
N = 466		
R SQUARED = 0.134		
F VALUE = 10.098		
S.E.E. = 0.514		
TOTAL HOURS WORKED		
INTERCEPT	978.366	
AGE IN YEARS	44.324	2.356
YEARS OF SCHOOLING	-36.346	-1.839
HOUSEHOLD HEAD DUMMY	425.805	1.934
SECONDARY OCCUPATION DUMMY ON SEX	-125.954	-1.727
ESTIMATED WAGE RATE	86.631	0.617
UNEMPLOYMENT COMPENSATION RATE	289.845	0.789
OTHER FAMILY + OWN UNEARNED INCOME	-0.034	-2.260
N = 466		
R SQUARED = 0.088		
F VALUE = 6.310		
S.E.E. = 655.936		
MEAN $\hat{W}$ = 2.578		
MEAN HOURS WORKED PER WEEK = 46.800		
MEAN WEEKS WORKED PER YEAR = 48.710		

TABLE A.5.1M: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE, 21 to 29 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENTS	T RATIO
LOG WAGE		
INTERCEPT	-4.961	
AGE IN YEARS	0.206	2.404
YEARS OF SCHOOLING	0.386	2.141
AGE*SCHOOL	-0.014	-1.920
PROFIT PER WORKER IN THE INDUSTRY	0.067	2.185

N = 154

R SQUARED = 0.146

F VALUE = 6.375

S.E.E. = 0.498

VARIABLE	COEFFICIENTS	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	255.294	
AGE IN YEARS	62.167	3.437
CHANGE IN SMSA UNEMPLOYMENT RATE	208.304	2.116
HOUSEHOLD HEAD DUMMY	398.715	1.834
LAYOFF RATE IN THE INDUSTRY	151.661	2.859
ESTIMATED WAGE RATE	-70.346	-0.711
UNEMPLOYMENT COMPENSATION RATE	671.542	1.130
OWN UNEARNED INCOME	0.190	1.098

N = 154

R SQUARED = 0.185

F VALUE = 4.738

S.E.E. = 470.611

MEAN Q = 2.600

MEAN HOURS WORKED PER WEEK = 46.156

MEAN WEEKS WORKED PER YEAR = 49.701

TABLE A.5.1N: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE, 21 to 29 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.331	
AGE IN YEARS	0.030	2.368
YEARS OF SCHOOLING	0.030	2.488
SMSA UNEMPLOYMENT RATE	-0.114	-2.422
CHANGE IN SMSA UNEMPLOYMENT RATE	0.128	1.684
HOUSEHOLD HEAD DUMMY	0.567	3.150
SECONDARY OCCUPATION DUMMY ON COLOR	-0.202	-2.103

N = 312

R SQUARED = 0.179

F VALUE = 11.050

S.E.E. = 0.510

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	876.408	
AGE IN YEARS	51.746	2.366
YEARS OF SCHOOLING	-31.090	-1.415
HOUSEHOLD HEAD DUMMY	523.486	1.696
ESTIMATED WAGE RATE	5.359	0.037
UNEMPLOYMENT COMPENSATION RATE	224.387	0.477
OTHER FAMILY + OWN UNEARNED INCOME	-0.060	-2.910

N = 312

R SQUARED = 0.094

F VALUE = 5.260

S.E.E. = 723.913

MEAN Q = 2.584

MEAN HOURS WORKED PER WEEK = 47.119

MEAN WEEKS WORKED PER YEAR = 48.221

TABLE A.5.2A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, MARRIED, WHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	1.024	
YEARS OF SCHOOLING	0.020	2.612
SMSA UNEMPLOYMENT RATE	-0.062	-2.509
VETERAN DUMMY	-0.278	-2.515
SECONDARY OCCUPATION DUMMY ON COLOR	-0.143	-3.081
VETERAN*SCHOOL	0.031	3.299

N = 1301

R SQUARED = 0.102

F VALUE = 29.435

S.E.E. = 0.532

TOTAL HOURS WORKED		
INTERCEPT	2497.468	
VETERAN DUMMY	-83.836	-2.106
SECONDARY OCCUPATION DUMMY ON SEX	-135.602	-3.032
ESTIMATED WAGE RATE	21.584	0.648
UNEMPLOYMENT COMPENSATION RATE	-600.959	-3.234
OWN UNEARNED INCOME	-0.032	-1.206

N = 1301

R SQUARED = 0.021

F VALUE = 5.542

S.E.E. = 589.229

MEAN $\hat{w}$ = 3.142

MEAN HOURS WORKED PER WEEK = 46.449

MEAN WEEKS WORKED PER YEAR = 49.894

TABLE A.5.2M: *REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE, 30 to 50 YEAR OLD, MANUFACTURING WORKERS*

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.089	
YEARS OF SCHOOLING	0.046	6.289
HOUSEHOLD HEAD DUMMY	0.422	2.312
SECONDARY OCCUPATION DUMMY ON COLOR	-0.179	-2.300
BUSINESS RECEIPTS PER WORKER IN INDUSTRY	0.005	2.737
N = 382		
R SQUARED = 0.152		
F VALUE = 16.871		
S.E.E. = 0.443		
TOTAL HOURS WORKED		
INTERCEPT	2043.894	
CHANGE IN SMSA UNEMPLOYMENT RATE	-122.670	-1.739
SECONDARY OCCUPATION DUMMY ON SEX	-185.609	-2.442
BUSINESS RECEIPTS PER WORKER	-4.286	-1.874
ESTIMATED WAGE RATE	59.433	1.092
UNEMPLOYMENT COMPENSATION RATE	511.465	1.333
OTHER FAMILY + OWN UNEARNED INCOME	-0.011	-1.089
N = 382		
R SQUARED = 0.046		
F VALUE = 3.004		
S.E.E. = 508.831		
MEAN $\hat{w}$ = 3.193		
MEAN HOURS WORKED PER WEEK = 45.188		
MEAN WEEKS WORKED PER YEAR = 49.984		

TABLE A.5.2N: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE, 30 to 50 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	1.236	
SMSA UNEMPLOYMENT RATE	-0.067	-2.267
VETERAN DUMMY	-0.499	-5.321
SECONDARY OCCUPATION ON COLOR	-0.168	-2.967
VETERAN*SCHOOL	0.052	7.559

N = 919

R SQUARED = 0.100

F VALUE = 25.490

S.E.E. = 0.561

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	2216.723	
YEARS OF SCHOOLING	30.886	2.853
VETERAN DUMMY	306.662	1.432
VETERAN*SCHOOL	-39.226	-1.909
ESTIMATED WAGE RATE	37.217	0.373
UNEMPLOYMENT COMPENSATION RATE	-865.360	-4.061
OWN UNEARNED INCOME	-0.042	-1.420

N = 919

R SQUARED = 0.034

F VALUE = 5.399

S.E.E. = 613.811

MEAN $\hat{w}$ = 3.120

MEAN HOURS WORKED PER WEEK = 46.974

MEAN WEEKS WORKED PER YEAR = 49.856

TABLE A.5.3A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, MARRIED, WHITE, 51 to 65 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	1.442	
AGE IN YEARS	-0.017	-2.543
YEARS OF SCHOOLING	0.050	6.263
SECONDARY OCCUPATION DUMMY ON COLOR	-0.176	-2.065

N = 514

R SQUARED = 0.110

F VALUE = 21.043

S.E.E. = 0.604

TOTAL HOURS WORKED		
INTERCEPT	2339.426	
SECONDARY OCCUPATION DUMMY ON SEX	-118.707	-1.965
ESTIMATED WAGE RATE	13.013	0.271
UNEMPLOYMENT COMPENSATION RATE	-254.838	-1.304
OWN UNEARNED INCOME	-0.076	-2.606

N = 514

R SQUARED = 0.024

F VALUE = 3.105 (significant at 5% level)

S.E.E. = 547.920

MEAN $\hat{w}$ = 2.708

MEAN HOURS WORKED PER WEEK = 45.144

MEAN WEEKS WORKED PER YEAR = 49.788

TABLE A.5.3M: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE, 51 to 65 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.553	
YEARS OF SCHOOLING	0.200	3.327
SECONDARY OCCUPATION DUMMY ON SEX	-0.214	-1.917
AGE*SCHOOL	-0.003	-2.761
PROFIT PER WORKER IN THE INDUSTRY	0.069	2.241

N = 143

R SQUARED = 0.169

F VALUE = 7.013

S.E.E. = 0.516

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1326.927	
BUSINESS RECEIPTS PER WORKER	9.801	2.766
PERCENT FEMALE IN THE INDUSTRY	5.449	1.772
ESTIMATED WAGE RATE	75.729	1.092
UNEMPLOYMENT COMPENSATION RATE	917.423	2.180
OWN UNEARNED INCOME	-0.038	-0.918

N = 143

R SQUARED = 0.107

F VALUE = 3.298

S.E.E. = 452.875

MEAN $\hat{w}$ = 2.920

MEAN HOURS WORKED PER WEEK = 44.077

MEAN WEEKS WORKED PER YEAR = 50.231

TABLE A.5.3N: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, WHITE, 51 to 65 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.321	
YEARS OF SCHOOLING	0.059	6.031
SECONDARY OCCUPATION DUMMY ON COLOR	-0.148	-1.498

N = 371

R SQUARED = 0.114

F VALUE = 23.562

S.E.E. = 0.629

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	3224.235	
AGE IN YEARS	-13.755	-1.820
CHANGE IN SMSA UNEMPLOYMENT RATE	-128.470	-1.726
SECONDARY OCCUPATION DUMMY ON SEX	-110.950	-1.506
ESTIMATED WAGE RATE	-24.060	-0.428
UNEMPLOYMENT COMPENSATION RATE	-477.218	-2.171
OWN UNEARNED INCOME	-0.089	-2.336

N = 371

R SQUARED = 0.053

F VALUE = 3.380

S.E.E. = 569.823

MEAN $\hat{W}$ = 2.642

MEAN HOURS WORKED PER WEEK = 45.555

MEAN WEEKS WORKED PER YEAR = 49.617

TABLE A.6.1A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, MARRIED, NONWHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-1.158	
AGE IN YEARS	0.042	2.195
YEARS OF SCHOOLING	0.073	3.087
SECONDARY OCCUPATION DUMMY ON COLOR	-0.237	-2.293
N = 92		
R SQUARED = 0.203		
F VALUE = 7.484		
S.E.E. = 0.472		
TOTAL HOURS WORKED		
INTERCEPT	1443.653	
ESTIMATED WAGE RATE	115.120	0.923
UNEMPLOYMENT COMPENSATION RATE	1201.120	2.807
OWN UNEARNED INCOME	-0.109	-0.141
N = 92		
R SQUARED = 0.083		
F VALUE = 2.670 (significant at 10% level)		
S.E.E. = 519.555		
MEAN $\hat{W}$ = 2.004		
MEAN HOURS WORKED PER WEEK = 44.207		
MEAN WEEKS WORKED PER YEAR = 49.065		

TABLE A.6.2A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, MARRIED, NONWHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.585	
YEARS OF SCHOOLING	0.028	2.888
SECONDARY OCCUPATION DUMMY ON COLOR	-0.285	-4.280
N = 242		
R SQUARED = 0.139		
F VALUE = 19.352		
S.E.E. = 0.484		
TOTAL HOURS WORKED		
INTERCEPT	2573.825	
SMSA UNEMPLOYMENT RATE	-90.452	-1.443
ESTIMATED WAGE RATE	-21.557	-0.239
UNEMPLOYMENT COMPENSATION RATE	-326.301	-1.409
OWN UNEARNED INCOME	0.178	1.618
N = 242		
R SQUARED = 0.026		
F VALUE = 1.562 (significant at 25% level)		
S.E.E. = 516.359		
MEAN $\hat{w}$ = 2.119		
MEAN HOURS WORKED PER WEEK = 43.393		
MEAN WEEKS WORKED PER YEAR = 49.628		

TABLE A.6.2M: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, NONWHITE, 30 to 50 YEAR OLD, MANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.556	
YEARS OF SCHOOLING	0.059	2.546
VETERAN DUMMY	-0.737	-1.967
VETERAN*SCHOOL	0.069	1.813
PERCENT UNIONIZATION IN INDUSTRY	0.017	3.972
N = 53		
R SQUARED = 0.445		
F VALUE = 9.603		
S.E.E. = 0.417		
TOTAL HOURS WORKED		
INTERCEPT	1605.102	
10 FIRM CONCENTRATION ESTIMATE	-5.359	-2.014
LAYOFF RATE IN THE INDUSTRY	187.197	3.067
ESTIMATED WAGE RATE	78.235	1.157
UNEMPLOYMENT COMPENSATION RATE	870.584	1.695
OTHER FAMILY + OWN UNEARNED INCOME	-0.006	-0.300
N = 53		
R SQUARED = 0.285		
F VALUE = 3.752		
S.E.E. = 320.005		
MEAN $\hat{w}$ = 2.472		
MEAN HOURS WORKED PER WEEK = 43.189		
MEAN WEEKS WORKED PER YEAR = 50.283		

TABLE A.6.2N: REGRESSION RESULTS FOR MALE, SOUTHERN, MARRIED, NONWHITE, 30 to 50 YEAR OLD, NONMANUFACTURING WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-0.074	
SECONDARY OCCUPATION DUMMY ON COLOR	-0.293	-3.899
AGE SQUARED	0.0004	2.091
AGE*SCHOOL	0.004	2.422
AGE SQUARED*SCHOOL	-0.00009	-2.221

N = 189

R SQUARED = 0.147

F VALUE = 7.911

S.E.E. = 0.478

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	2120.623	
ESTIMATED WAGE RATE	101.637	0.834
UNEMPLOYMENT COMPENSATION RATE	-294.798	-1.223
OTHER FAMILY + OWN UNEARNED INCOME	-0.017	-1.102

N = 189

R SQUARED = 0.022

F VALUE = 1.409 (significant at 25% level)

S.E.E. = 554.145

MEAN $\hat{w}$ = 1.952

MEAN HOURS WORKED PER WEEK = 43.450

MEAN WEEKS WORKED PER YEAR = 49.444

TABLE A.6.3A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, MARRIED, NONWHITE, 51 to 65 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	3.648	
AGE IN YEARS	-0.052	-3.341
SECONDARY OCCUPATION DUMMY ON COLOR	-0.277	-2.244

N = 111
R SQUARED = 0.147
F VALUE = 9.342
S.E.E. = 0.644

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	1564.191	
ESTIMATED WAGE RATE	220.229	1.883
UNEMPLOYMENT COMPENSATION RATE	170.512	0.686
OWN UNEARNED INCOME	-0.050	-0.396

N = 111
R SQUARED = 0.038
F VALUE = 1.427 (significant at 25% level)
S.E.E. = 511.356
MEAN $\hat{w}$ = 1.768
MEAN HOURS WORKED PER WEEK = 40.910
MEAN WEEKS WORKED PER YEAR = 49.351

TABLE A.7.1A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, UNMARRIED, WHITE, 21 to 29 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	-1.046	
AGE IN YEARS	0.072	3.596
SECONDARY OCCUPATION DUMMY ON COLOR	-0.230	-1.918
N = 137		
R SQUARED = 0.106		
F VALUE = 7.974		
S.E.E. = 0.574		
TOTAL HOURS WORKED		
INTERCEPT	1309.320	
ESTIMATED WAGE RATE	209.216	1.682
UNEMPLOYMENT COMPENSATION RATE	887.668	3.031
OWN UNEARNED INCOME	-0.321	-1.516
N = 137		
R SQUARED = 0.102		
F VALUE = 5.045		
S.E.E. = 553.292		
MEAN $\hat{W}$ = 1.954		
MEAN HOURS WORKED PER WEEK = 43.058		
MEAN WEEKS WORKED PER YEAR = 47.511		

TABLE A.7.2A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, UNMARRIED, WHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.260	
YEARS OF SCHOOLING	0.054	2.935

N = 115
R SQUARED = 0.071
F VALUE = 8.612
S.E.E. = 0.760

VARIABLE	COEFFICIENT	T RATIO
TOTAL HOURS WORKED		
INTERCEPT	2241.323	
AGE IN YEARS	-17.523	-1.597
VETERAN DUMMY	191.178	1.373
ESTIMATED WAGE RATE	156.950	1.097
UNEMPLOYMENT COMPENSATION RATE	445.511	0.860
OWN UNEARNED INCOME	-0.094	-0.786

N = 115
R SQUARED = 0.059
F VALUE = 1.373 (significant at 25% level)
S.E.E. = 671.779
MEAN $\hat{w}$ = 2.564
MEAN HOURS WORKED PER WEEK = 44.426
MEAN WEEKS WORKED PER YEAR = 49.017

TABLE A.8.2A: REGRESSION RESULTS FOR ALL MALE, SOUTHERN, UNMARRIED, NONWHITE, 30 to 50 YEAR OLD WORKERS

VARIABLE	COEFFICIENT	T RATIO
LOG WAGE		
INTERCEPT	0.743	
SECONDARY OCCUPATION DUMMY ON COLOR	-0.452	-2.638
N = 70		
R SQUARED = 0.093		
F VALUE = 6.958		
S.E.E. = 0.703		
TOTAL HOURS WORKED		
INTERCEPT	227.967	
SECONDARY OCCUPATION DUMMY ON COLOR	478.412	1.485
ESTIMATED WAGE RATE	681.378	1.813
UNEMPLOYMENT COMPENSATION RATE	863.888	2.399
OWN UNEARNED INCOME	-0.161	-0.718
N = 70		
R SQUARED = 0.126		
F VALUE = 2.344 (significant at 10% level)		
S.E.E. = 551.607		
MEAN $\hat{W}$ = 1.651		
MEAN HOURS WORKED PER WEEK = 42.771		
MEAN WEEKS WORKED PER YEAR = 46.929		

BIBLIOGRAPHY

Ashenfelter, Orley. "Using Estimates of Income and Substitution Parameters to Predict the Work Incentive Effects of the Negative Income Tax: A Brief Exposition and Partial Summary." Unpublished, 1970.

Blinder, Alan S. "Wage Discrimination: Reduced Form and Structural Estimates." _Journal of Human Resources_, Vol. 8 (Fall, 1973), 436-456.

Boskin, Michael J. "The Negative Income Tax and the Supply of Work Effort." _National Tax Journal_, Vol. 20 (December, 1967), 353-367.

Browning, Edgar K. "Incentive and Disincentive Experimentation for Income Maintenance Policy Purposes: Note." _American Economic Review_, Vol. 61 (September, 1971), 709-712.

________. "Alternative Programs for Income Redistribution: The NIT and NWT." _American Economic Review_, Vol. 63 (March, 1973), 38-49.

Cain, Glen C., and Watts, Harold W. "Toward a Summary and Synthesis of the Evidence." _Income Maintenance and Labor Supply_. Edited by Glen C. Cain and Harold W. Watts. Chicago: Rand McNally College Publishing Company, 1973.

Cohen, Malcolm; Rea, Samuel; and Lerman, Robert. _A Micro Model of Labor Supply_. Washington, D.C.: Government Printing Office, 1970.

Cooper, Gershon. "Taxation and Incentive in Mobilization." _Quarterly Journal of Economics_, Vol. 66 (February, 1952), 43-66.

Council of Economic Advisers. _Economic Report of the President_. Washington, D.C.: Government Printing Office, 1964.

Diamond, Peter A. "Negative Taxes and the Poverty Problem--A Review Article." _National Tax Journal_, Vol. 21 (September, 1968), 288-303.

Friedman, Milton. _Capitalism and Freedom_. Phoenix Books. Chicago: University of Chicago Press, 1964.

Fuchs, Victor R. _The Service Economy_. National Bureau of Economic Research. New York: Columbia University Press, 1968.

Gallaway, Lowell E. "Negative Income Tax Rates and the Elimination of Poverty." National Tax Journal, Vol. 19 (September, 1966), 298-307.

Green, A. Romney. "Social Reconstruction by the Regulation of Incomes." Economic Journal, Vol. 52 (April, 1942), 37-44.

Green, Christopher. Negative Taxes and the Poverty Problem. Washington, D.C.: Brookings Institution, 1967.

________, and Lampman, Robert J. "Schemes for Transferring Income to the Poor." Industrial Relations, Vol. 6 (February, 1967), 121-137.

________. "Negative Taxes and Monetary Incentives to Work: The Static Theory." Journal of Human Resources, Vol. 3 (Summer, 1968), 280-288.

________, and Tella, Alfred. "Effect of Nonemployment Income and Wage Rates on the Work Incentives of the Poor." Review of Economics and Statistics, Vol. 51 (November, 1969), 399-408.

Hall, Robert E. "Turnover in the Labor Force." Brookings Papers on Economic Activity, No. 3 (1972), 709-756.

Hildebrand, George H. "Second Thoughts on the Negative Income Tax." Industrial Relations, Vol. 6 (February, 1967), 138-154.

Hill, C. Russell. "The Economic Determinants of Labor Supply for the Urban Poor." Unpublished, 1969.

Johnston, J. Econometric Methods. 2nd. ed. New York: McGraw-Hill Book Company, 1972.

Kershaw, Joseph A. Government Against Poverty. Washington, D.C.: Brookings Institution, 1970.

Kesselman, Jonathan. "The Negative Income Tax and the Supply of Work Effort: Comment." National Tax Journal, Vol. 22 (September, 1969), 411-416.

Kisker, Klaus P. "A Note on the Negative Income Tax." National Tax Journal, Vol. 20 (March, 1967), 102-105.

Kosters, Marvin. "Effect of an Income Tax on Labor Supply." The Taxation of Income from Capital. Edited by Arnold Harberger and Martin Bailey. Washington, D.C.: Brookings Institution, 1969.

Lampman, Robert J. "Approaches to the Reduction of Poverty." American Economic Review, Supplement, Vol. 55 (May, 1965), 521-529.

Lees, Dennis. "Controversy Surrounding Negative Income Taxation: Comment." Public Finance, Vol. 24 (1969), 362-366.

Leuthold, Jane. "An Empirical Study of Formula Income Transfers and the Work Decision of the Poor." Journal of Human Resources, Vol. 3 (Summer, 1968), 312-323.

May, Edgar. The Wasted Americans. New York: Harper and Row Publishers, 1964.

Oi, Walter Y. "Labor as a Quasi-Fixed Factor." Journal of Political Economy, Vol. 70 (December, 1962), 538-555.

Orcutt, Guy H., and Orcutt, Alice G. "Incentive and Disincentive Experimentation for Income Maintenance Policy Purposes." American Economic Review, Vol. 58 (September, 1968), 759-761.

Perlman, Richard. "A Negative Income Tax Plan for Maintaining Work Incentives." Journal of Human Resources, Vol. 3 (Summer, 1968), 289-299.

Perry, George L. "Unemployment Flows in the U.S. Labor Market." Brookings Papers on Economic Activity, No. 2 (1972), 245-278.

Rhys-Williams, Lady Juliet. Taxation and Incentive. New York: Oxford University Press, 1953.

Rolph, Earl R. "The Case for a Negative Income Tax Device." Industrial Relations, Vol. 6 (February, 1967), 155-165.

________. "Controversy Surrounding Negative Income Taxation." Public Finance, Vol. 24 (1969), 352-361.

Rosen, Sherwin, and Welch, Finis. "Labor Supply and Income Redistribution." Review of Economics and Statistics, Vol. 53 (August, 1971), 278-282.

________, and ________. "A Note on the Estimation or Labor Supply Effects and Income Redistribution Policy." Journal of Human Resources, Vol. 7 (Winter, 1972), 104-111.

Taussig, Michael K. "Negative Income Tax Rates and the Elimination of Poverty: Comment." National Tax Journal, Vol. 20 (September, 1967), 328-337.

Theil, Henri. Principles of Econometrics. New York: John Wiley & Sons, Inc., 1971.

Thurow, Lester C. Poverty and Discrimination. Washington, D.C.: Brookings Institute, 1969.

Tobin, James. "On Improving the Economic Status of the Negro." Daedalus, Vol. 94 (Fall, 1965), 878-898.

U.S. Department of Commerce. Bureau of the Census. *The Current Population Survey: A Report on Methodology*, Technical Paper No. 7. Washington, D.C.: Government Printing Office, 1963.

________. ________. *U.S. Census of the Population*, PC (2)-7A. "Occupational Characteristics." Washington, D.C.: Government Printing Office, 1963.

U.S. Department of Health, Education, and Welfare. Social Security Administration. *Social Security Bulletin*, Vol. 36 (November, 1973). Washington, D.C.: Government Printing Office.

U.S. Department of Labor. Bureau of Labor Statistics. *Manpower Report of the President, 1968.* Washington, D.C.: Government Printing Office, April, 1968.

________. ________. *Employment and Earning Statistics for the United States: 1909-68*, Bulletin 1312-6. Washington, D.C.: Government Printing Office, August, 1968.

U.S. Department of the Treasury. Internal Revenue Service. *Business Income Tax Returns: Statistics of Income, 1966.* Washington, D.C.: Government Printing Office, March, 1969.

Watts, Harold W. "Graduated Work Incentives: An Experiment in Negative Taxation." *American Economic Review*, Supplement, Vol. 59 (May, 1969), 463-472.

________. "The Graduated Work Incentive Experiment: Current Progress." *American Economic Review*, Supplement, Vol. 61 (May, 1971), 15-21.

END

DEPT. OF HEW

NAT'L INSTITUTE OF EDUCATION

ERIC

DATE FILMED

MAR 26 75